

North Carolina MEDICAL JOURNAL

a journal of health policy analysis and debate

School Health Policy in North Carolina



www.ncmedicaljournal.com
November/December 2008, 69:6

Also in this Issue:
North Carolina Child
Health Report
Card

www.carolinasmedicalcenter.org

Your daughter stole your heart the day she was born.

She deserves to know it's in good hands today.



We've set the standard for critical cardiac care for over 50 years. With more world class specialists and more advanced technology, we're giving more parents second chances. In fact, our uncompromising excellence and commitment to care give you more of everything. It's who we are at Carolinas Medical Center.



Carolinas Medical Center

Uncompromising Excellence. Commitment to Care.



BE A PLAYER

*Get up and Play
an Hour a Day!*

YOU DON'T HAVE TO BE AN NFL STAR LIKE REGGIE BUSH TO BE A PLAYER! JUST GET UP AND PLAY AN HOUR A DAY! IT'S A GREAT WAY TO BE HEALTHY, HAVE FUN, AND AVOID A LAZY PENALTY. BEING HEALTHY AND STAYING ACTIVE IS IMPORTANT. VISIT [SMALLSTEP.GOV](http://smallstep.gov) TO LEARN ABOUT FUN WAYS TO GET AN HOUR OF EXERCISE A DAY!



www.smallstep.gov



ANNOUNCING a New Section in the *NC Medical Journal*

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-elect 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.

North Carolina
MEDICAL JOURNAL

Publishers of the *North Carolina Medical Journal*

The North Carolina Institute of Medicine

In 1983 the North Carolina General Assembly chartered the North Carolina Institute of Medicine as an independent, quasi-state agency to serve as a nonpolitical source of analysis and advice on issues of relevance to the health of North Carolina's population. The Institute is a convenor of persons and organizations with health-relevant expertise, a provider of carefully conducted studies of complex and often controversial health and health care issues, and a source of advice regarding available options for problem solution. The principal mode of addressing such issues is through the convening of task forces consisting of some of the state's leading professionals, policy makers, and interest group representatives to undertake detailed analyses of the various dimensions of such issues and to identify a range of possible options for addressing them.



The Duke Endowment

The Duke Endowment, headquartered in Charlotte, NC, is one of the nation's largest private foundations. Established in 1924 by industrialist James B. Duke, its mission is to serve the people of North Carolina and South Carolina by supporting programs of higher education, health care, children's welfare and spiritual life. The Endowment's health care grants provide assistance to not-for-profit hospitals and other related health care organizations in the Carolinas. Major focus areas include improving access to health care for all individuals, improving the quality and safety of the delivery of health care, and expanding preventative and early intervention programs. Since its inception, the Endowment has awarded \$2.2 billion to organizations in North Carolina and South Carolina, including more than \$750 million in the area of health care.

THE DUKE ENDOWMENT

Publisher Pam C. Silberman, JD, DrPH / NC Institute of Medicine, Morrisville
Publisher Eugene W. Cochrane Jr / The Duke Endowment, Charlotte
Editor-In-Chief Thomas C. Ricketts III, PhD, MPH / University of North Carolina, Chapel Hill
Scientific Editor John W. Williams Jr, MD, MHS / Duke University Medical Center, Durham
Editor Emeritus Gordon H. DeFries, PhD / University of North Carolina, Chapel Hill
Editor Emeritus Francis A. Neelon, MD / Duke University, Durham
Associate Editor Dana D. Copeland, MD, PhD / WakeMed, Raleigh
Associate Editor Mark Holmes, PhD / NC Institute of Medicine, Morrisville
Associate Editor Mary L. Piepenbring / The Duke Endowment, Charlotte
Associate Editor Charles F. Willson, MD / East Carolina University, Greenville
Section Editor, Running the Numbers Paul A. Buescher, PhD / NC DHHS, Raleigh
Managing Editor Christine Nielsen, MPH / NC Institute of Medicine, Morrisville
Assistant Managing Editor Phyllis Blackwell / NC Institute of Medicine, Morrisville
Business Manager Adrienne R. Parker / NC Institute of Medicine, Morrisville

North Carolina MEDICAL JOURNAL

*Founded by the North Carolina Medical Society in 1849
 Published by the North Carolina Institute of Medicine and The Duke Endowment*

Editorial Board

Cynthia B. Archie, RN, EdD / Wayne Community College, Goldsboro
 William K. Atkinson II, PhD, MPH / WakeMed, Raleigh
 J. Steven Cline, DDS, MPH / Division of Public Health / NC DHHS, Raleigh
 Fred M. Eckel, MS / NC Association of Pharmacists, Chapel Hill
 Elizabeth R. Gamble, MSPH, MD / Wake Forest University, Winston-Salem
 Ted W. Goins Jr / Lutheran Services for the Aging, Inc, Salisbury
 Beth A. Griffin, MHP, PA-C / Wilmington
 Blaine Paxton Hall, PA-C / Durham Regional Hospital, Durham
 Margaret N. Harker, MD / Morehead City
 Robert T. Harris, MD / Raleigh
 Olson Huff, MD / Action for Children North Carolina, Asheville
 Thomas G. Irons, MD / East Carolina University, Greenville
 Delma H. Kinlaw, DDS / Cary
 Julienne K. Kirk, PharmD / Wake Forest University, Winston-Salem
 Ricky L. Langley, MD, MPH / Division of Public Health / NC DHHS, Raleigh
 Mark Massing, MD, PhD / The Carolinas Center for Medical Excellence, Cary
 Jane B. Neese, RN, PhD / University of North Carolina, Charlotte
 M. Alec Parker, DMD / NC Dental Society, Fletcher
 Deborah Porterfield, MD, MPH / Division of Public Health / NC DHHS, Raleigh
 Senator William R. Purcell, MD / NC General Assembly, Laurinburg
 Dennis R. Sherrod, RN, EdD / Winston-Salem State University, Winston-Salem
 Polly Godwin Welsh, RN-C / NC Health Care Facilities Association, Raleigh
 Joyce M. Young, MD, MPH / IBM Corporation, Research Triangle Park

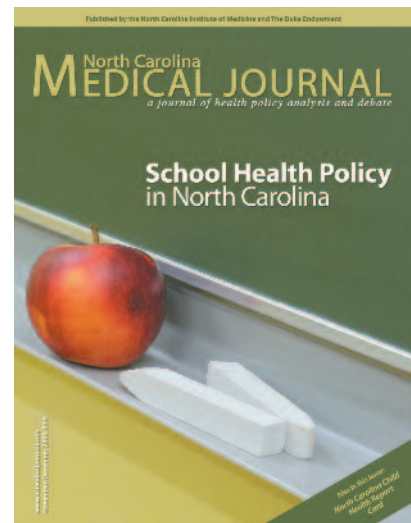
The *North Carolina Medical Journal* (ISSN 0029-2559) is published by the North Carolina Institute of Medicine and The Duke Endowment under the direction of the Editorial Board. Copyright 2008 © North Carolina Institute of Medicine. Address manuscripts and communications regarding editorial matters to the managing editor. Address communications regarding advertising and reader services to the assistant managing editor. Opinions expressed in the *North Carolina Medical Journal* represent only the opinions of the authors and do not necessarily reflect the official policy of the North Carolina Medical Journal or the North Carolina Institute of Medicine. All advertisements are accepted subject to the approval of the editorial board. The appearance of an advertisement in the *North Carolina Medical Journal* does not constitute any endorsement of the subject or claims of the advertisement. This publication is listed in *PubMed*.

Managing Editor: Christine Nielsen, MPH, 919.401.6599, ext. 25 or christine_nielsen@nciom.org. **Assistant Managing Editor:** Phyllis A. Blackwell, 919.401.6599, ext. 27 or phyllis_blackwell@nciom.org. **Graphic Design:** Angie Dickinson, angiedesign@windstream.net. **Printing:** The Ovid Bell Press, Inc, 1201-05 Bluff Street, Fulton, MO 65251, 800.835.8919. **Annual Subscriptions (6 issues):** Individual \$42.80 (\$40 plus 7% NC tax). Institutional: \$64.20 (\$60 plus 7% NC tax).

The *North Carolina Medical Journal* (ISSN 0029-2559) is published bimonthly: January/February, March/April, May/June, July/August, September/October, and November/December. Periodicals postage paid at Morrisville, NC 27560 and at additional mailing offices. **POSTMASTER:** Send address changes to the *North Carolina Medical Journal*, 630 Davis Drive, Suite 100, Morrisville, NC 27650. **Canada Agreement Number:** PM40063731. Return undeliverable Canadian addresses to: Station A, PO Box 54, Windsor, ON N9A 6J5, Email: returnsil@imex.pb.com

Cosponsors of the North Carolina Medical Journal are The Carolinas Center for Medical Excellence / North Carolina Association of Pharmacists / North Carolina Dental Society / North Carolina Health Care Facilities Association / North Carolina Hospital Association / North Carolina Medical Society
 Members of these organizations receive the *Journal* as part of their membership fees. Additional major funding support comes from **The Duke Endowment**.

New Location in Research Triangle Park: 630 Davis Dr., Suite 100, Morrisville, NC 27560
 Phone: 919.401.6599 • Fax: 919.401.6899 • Email: ncmedj@nciom.org
<http://www.ncmedicaljournal.com>



There Are
 More Than
36,000
 Reasons
 to Advertise
 in the *North
 Carolina
 Medical
 Journal*

Six times a year, the
*North Carolina Medical
 Journal* reaches more
 than 36,000 health care
 professionals and policy
 shapers directly, and each
 month more than 50,000
 access the *Journal* via our
 website—making it the
 most widely distributed
 North Carolina-based,
 health-focused journal
 in the state.



Danny R. wrote

at 7:44pm Saturday

Hey — let me know if you want some help with school work this weekend. I'm around.

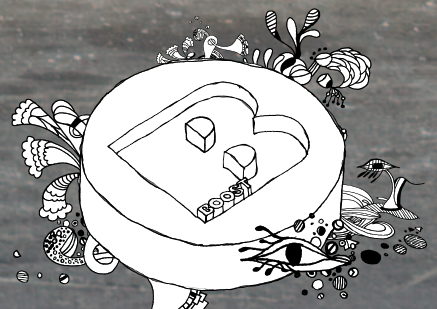
Message

message



HELP A FRIEND GRADUATE
AT BOOSTUP.ORG

Ad
Council



North Carolina MEDICAL JOURNAL

a journal of health policy analysis and debate

November/December 2008, Volume 69, Number 6 Published by the North Carolina Institute of Medicine and The Duke Endowment

PEER-REVIEWED ARTICLES

- 432** Making an IMPACT: Effect of a School-Based Pilot Intervention
Natalie Digate Muth, MD, MPH, RD; Avik Chatterjee, MD; Donna Williams, MEd; Alan Cross, MD; Kori Flower, MD, MPH, MS
- 441** Control of Blood Pressure in North Carolina Primary Care: Baseline Data from the GLAD Heart Trial
Erica L. Rosenberger, MS; David C. Goff, Jr., MD, PhD; Cralen C. Davis, MS; Caroline S. Blackwell; Alain G. Bertoni, MD, MPH
- 447** Epidemiology of Respiratory Syncytial Virus in Various Regions Within North Carolina During Multiple Seasons
David A. Wilfret, MD; Brent T. Baker, MD; Elizabeth Palavecino, MD; Cassandra Moran, DO; Daniel K. Benjamin Jr., MD, PhD

POLICY FORUM

School Health Policy in North Carolina

- 460** Introduction
Thomas C. Ricketts III, PhD, MPH; Christine Nielsen, MPH
- 461** Issue Brief: School Health Policy in North Carolina
Paula Hudson Collins, MHD, RHEd; Howard N. Lee, MSW

COMMENTARIES

- 467** North Carolina's Standard Course of Study in Healthful Living Education
Donna Breitenstein, EdD
- 468** Sidebar: Teaching Health
Linda Harrill Rudisill
- 472** What's for Lunch in North Carolina's Public Schools—Healthy Foods or Healthy Finances?
Lynn Hoggard, EdD, RD, LDN, FADA
- 476** Accountability Means Quality Physical Activity
Ernest Holcomb
- 478** Sidebar: Implementing North Carolina's Healthy Active Children Policy
Heather D. Pope
- 482** Sidebar: Programs Addressing Health in North Carolina's Schools
David K. Jones

- 484** School Nurses, Counselors, and Child and Family Support Teams
Tony Troop; Carol P. Tyson, RN, MPH
- 487** The Role of the Primary Care Physician in School Health: The Wayne County Experience
Dave Tayloe Jr., MD, FAAP
- 490** School-Based Dental Disease Prevention and Oral Health Education: Programs of the North Carolina Oral Health Section
Rebecca S. King, DDS, MPH; R. Gary Rozier, DDS, MPH
- 495** The Case for a Comprehensive, Effective, and Realistic Anti-Bullying Policy in North Carolina's Schools
Representative Rick Glazier, JD
- 498** Understanding the Role of Special Education in North Carolina's Public Schools
Mary N. Watson
- 500** Immunizations and the Role of North Carolina Schools
Beth Rowe-West, RN; Amy Caruso
- 502** School-Based Substance Abuse Prevention: A Public Health Perspective
Anne Thomas, MPA; Sheila Davies
- 505** Teen Pregnancy in North Carolina
Kay Phillips

DEPARTMENTS

- 431** Tarheel Footprints in Health Care
- 508** Philanthropy Profile
- 511** Running the Numbers
- 515** Spotlight on the Safety Net
- 517** Readers' Forum
- 519** Classified Ads
- 520** Index of Advertisers

Also in this issue:

- 453** 2008 North Carolina Child Health Report Card
Action for Children North Carolina and the North Carolina Institute of Medicine

SCHOOL SUPPLIES



WHOLE GRAINS Snack on ready-to-eat, whole grain cereals or whole grain crackers.



VEGETABLES Try crunchy vegetables as a school snack.



MILK Include fat-free or low-fat milk with meals or snacks.



FRUITS Vary your fruit choices. Fruits differ in nutrient content.



MEAT AND BEANS Choose lean turkey, chicken, roast beef or ham for sandwiches.



Success in school depends on a lot more than the right pencils, books and erasers. Studies show that a diet rich in vegetables, fruits and whole grains, along with a healthy lifestyle, can help your child succeed. Find out how good nutrition can lead to great things at MyPyramid.gov.



Tarheel Footprints in Health Care

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

Linda Harrill Rudisill



Linda Harrill Rudisill taught health education for 41 years in Gaston County Schools and continues to advocate for quality health education.

Linda Harrill Rudisill has been recognized as the Outstanding Health Educator in North Carolina for good reason. She is a “walk-the-walk” role model and passionate advocate for health education in our public schools. Linda retired in 2004 after 41 years of teaching Healthful Living Education to middle school students in Gaston County. Her commitment to teaching health has been an inspiration to students, families, the community, and her colleagues. Linda believes that, “health education has the potential to be life-changing and life-sustaining. The relevance and value of health education is woven into the daily lives of students.”

Linda graduated from Appalachian State University and completed her master’s degree at Gardner-Webb University. She has been very active in professional organizations at the state, regional, and national levels, participating in the North Carolina, Southern District, and American Alliances for Athletics, Health, Physical Education, Recreation, and Dance. She served on the national committee to establish National Health Education Standards and believes that health education can enhance the lives of young people and their families.

As a teacher, Linda required her students to be respectful of one another and fostered nurturing relationships. She took the lead in designing professional development for teachers, counselors, and nurses in violence prevention, anti-bullying, and anti-harassment. Her students appreciated her positive and affirming classroom and continue to stay in touch with her decades after graduation.

Since retirement, Linda has served as a consultant for Gaston County Schools and continues to work as a writer, reviewer, and trainer for the North Carolina School Health Training Center. She has assisted with the production of the teacher manuals *Successfully Teaching Middle School Health* and *Successfully Teaching High School Health* (currently in their third and fourth editions).

In addition to being honored as a Teacher of the Year in North Carolina, Linda has been recognized as Teacher of the Year for the Southern District. She has received the prestigious Honor Award from the North Carolina Alliance for Athletics, Health, Physical Education, Recreation, and Dance (NCAAHPERD), and NCAAHPERD’s Health Association has established the Linda Harrill Rudisill Lifetime Achievement Award.

Linda and her husband Ken reside in Lincolnton where she is active on the board of the Lincoln County YMCA. In 2007, she was honored by the YMCA with the Volunteer of the Year award. In 1986, Linda was recognized as the Woman of the Year in Lincoln County. She is active in her church and serves as an Ambassador for NCAAHPERD and on the Cancer Services of Gaston County Board of Directors, the Adolescent Pregnancy Prevention Council of Gaston County, and the School Health Advisory Council for Gaston County Schools.

Linda is a generous colleague and wonderful teacher. She is admired within the field of health education for working diligently for more than four decades to help young people make healthy decisions in nutrition, fitness, and the prevention of risky behaviors such as violence, substance abuse, and the use of tobacco. North Carolina’s youth could not have a better advocate for health.

Contributed by Donna Breitenstein, EdD, director of the North Carolina School Health Training Center.

Making an IMPACT: Effect of a School-Based Pilot Intervention

Natalie Digate Muth, MD, MPH, RD; Avik Chatterjee, MD; Donna Williams, MEd; Alan Cross, MD; Kori Flower, MD, MPH, MS

Abstract

Background: Poor nutrition and inactivity are widespread and contribute to the epidemic problem of childhood obesity. This study examined the effectiveness of a school-based pilot program to improve nutrition and activity in elementary (ES) and high school (HS) students.

Methods: The Improving Meals and Physical Activity in Children and Teens (IMPACT) school-based curriculum used a train-the-trainer model to improve activity and nutrition. Nine students were recruited from one rural North Carolina high school and trained in the IMPACT curriculum and leadership skills. Four 4th grade classes at a neighboring elementary school were randomized to receive the IMPACT curriculum delivered by the HS students over 12 weeks (two classrooms, 38 students) versus the standard curriculum (two classrooms, 37 students). Pre- and post-intervention surveys were used to assess program effectiveness.

Results: ES students in the intervention classes reported increased fruit and vegetable intake (+0.85 servings/day compared with controls; $p < 0.05$) and improved knowledge of the food group in which to eat the most servings ($p < 0.01$). ES students who participated in the IMPACT curriculum also reported increased intake of calcium-rich foods and grains, though these results were not statistically significant. Similar though nonsignificant improvements in diet behaviors were reported by the HS students who assisted in delivering the 4th grade curriculum.

Limitations: Study limitations include small sample size, risk of cross-contamination, and short program duration.

Conclusions: ES students who participated in the IMPACT curriculum reported improved dietary behaviors and knowledge. School-based curricula such as IMPACT may help improve nutrition among ES students.

Keywords: nutrition; fitness; school health instruction

North Carolina faces a childhood obesity epidemic; over 40% of 5-18 year olds are overweight (>85th percentile to <95th percentile of gender-specific BMI for age) or obese (≥ 95 th percentile of gender-specific BMI for age).¹ These children are at increased risk of social marginalization, type 2 diabetes, cardiovascular disease, and other morbidities² which often persist into adolescence and adulthood.³ The increasing prevalence of childhood overweight is likely due to both worsening nutrition habits and decreased physical activity. In 2007, only 15% of North Carolina's high school students reported eating at least five daily servings of fruits and vegetables in the past seven days⁵ while three-fourths said they eat fast food at least once per week.⁶ Less than half of North Carolina's middle and high school students engage in at least 60 minutes of physical activity five or more days per week.⁵

Schools are an important venue for promoting nutrition and physical activity among children, who are a "captive audience" for approximately 180 days each year. School-based obesity prevention interventions have led to improved health behaviors including decreased television viewing, decreased soft drink consumption, improved body mass index (BMI), and improved nutrition and physical activity behaviors.^{7,8} Despite promising results from these programs, few schools provide nutrition education or daily physical activity opportunities.⁹ Rigorous academic standards and budget constraints limit the amount of time allocated to physical activity and nutrition education. Previous elementary school interventions have demonstrated increased physical activity but have required additional time and resources.^{10,11} We were interested in developing a nutrition and physical activity intervention that could be incorporated into

Natalie Digate Muth, MD, MPH, RD, is a recent graduate of the University of North Carolina School of Medicine. She can be reached at natalie_muth@med.unc.edu.

Avik Chatterjee, MD, is an intern in the Yale Internal Medicine/Pediatrics Residency Training Program at Yale University.

Donna Williams, MEd, is the director of Healthful Living, Athletics, and Driver Education in the Orange County School System in North Carolina.

Alan Cross, MD, is a professor of social medicine and pediatrics in the Department of Social Medicine at the University of North Carolina at Chapel Hill.

Kori Flower, MD, MPH, MS, is a staff physician at the Charles Drew Community Health Center of Piedmont Health Services in Burlington, North Carolina.

the traditional school day and ultimately be sustained by the school system.

We drew upon Social Cognitive Theory,¹² recognizing the reciprocal influence of the school environment on diet and activity behaviors. Within the school environment, we theorized that students could acquire new knowledge and skills to change diet and activity behaviors. Further, we hypothesized that peer modeling of desired behaviors could motivate students' behavior change. Previous health education programs have reported that peer-led interventions produce comparable or better results than adult-led programs.¹³

In designing the IMPACT school-based pilot intervention, we used peer modeling to influence the behavior of three groups of learners: medical students, high school (HS) students, and elementary school (ES) students. The project was a collaborative partnership between a university medical center and a rural school district and included medical students as health educators. To reinforce learning, we employed a train-the-trainer model. In the first phase, medical students, including study authors Muth and Chatterjee, trained HS students as health educators; in the second phase, medical students and HS students implemented the IMPACT diet and activity curriculum in an elementary school. Although previous programs have used HS students as health educators for their peers,^{14,15} to the authors' knowledge such programs have not involved elementary school students. The objective of this pilot study was to evaluate the IMPACT program's effect on HS and ES participants' knowledge, attitudes, and behavior regarding nutrition and physical activity.

METHODS

Subjects

The IMPACT curriculum was implemented in a rural North Carolina high school and elementary school that were selected based on location, close proximity to each other, and support of school leadership. Nine HS students were selected from a health occupations class based on their interest and application to assist in educating ES students about nutrition and activity. The HS students and their parents signed informed consent forms before participating. Teachers provided approval for HS students to miss three classes during the semester to assist with implementing the ES curriculum. Study authors Muth and Chatterjee recruited eight additional medical student volunteers with an interest in nutrition, physical fitness, and pediatrics. These 10 medical student leaders were interested in providing community service and outreach to local public schools. They received a short training on anthropometry and attended a 15-hour teen training on the IMPACT curriculum led by two of the study authors—a registered dietitian (Muth) and a former high school teacher (Chatterjee).

In the participating elementary school, 4th grade classrooms were randomized to two intervention (38 students) and two control classrooms (37 students). The intervention curriculum was implemented by HS students and two medical students who were supervised by each class's usual ES teacher. Each student signed an assent form and each student's parent/guardian

signed an informed consent to participate in the intervention or serve as a control. The study was approved by the Biomedical Research Institutional Review Board at the University of North Carolina School of Medicine.

Instruments

The primary outcome for both HS and ES students was change in self-reported nutrition and physical activity knowledge, attitudes, and behaviors. The authors assessed this pre- and post-intervention using a validated age-appropriate Texas School Physical Activity and Nutrition (SPAN) questionnaire.¹⁶ HS students completed this written questionnaire independently at enrollment. Under the supervision of their teacher, ES students completed an age-appropriate version of the written questionnaire which included pictures of sample foods and serving sizes. Students self-reported demographic information including sex, ethnic background, and birth date, which were used to calculate exact age in months at enrollment. The questionnaire included the following *nutrition behaviors*: self-reported number of servings in the past 24 hours of milk, cheese, yogurt, whole wheat bread, rice/pasta, white bread, cereal, vegetables, fruits, fruit juice, sweetened drinks, soft drinks, fries/chips, and sweets. For these items, students were given closed-ended response options (0, 1, 2, or 3 or more servings in the past 24 hours). Since the authors were interested in examining effects of the intervention on specific nutrient groups (calcium-containing foods, grains, and fruits and vegetables), scores were calculated for each of these nutrient groups by summing the appropriate individual items. For example, calcium scores for each student were calculated by summing the number of daily servings of milk, cheese, and yogurt.

Students also self-reported the following *physical activity behaviors* on the questionnaire: number of hours of TV, computer, and video games in last 24 hours and number of days per week of moderate physical activity (defined as at least 30 minutes of exercise that did not increase heart rate or cause hard breathing) and vigorous physical activity (defined as at least 20 minutes of activity that increased heart rate or caused hard breathing). To examine overall sedentary activity, number of daily hours of TV, computer, and video game time were summed. Days per week of moderate and vigorous physical activity were summed to evaluate overall physical activity.

Questionnaire items also assessed students' *diet knowledge* (i.e. which food group the most and fewest servings should come from and how many servings of fruits and vegetables are recommended daily). For these items multiple response options were provided and responses were tallied as correct only if they selected the single most appropriate answer. The authors compared the proportion of students who answered these questions correctly pre- and post-intervention. *Diet/activity attitudes* were assessed through two items: belief that diet can affect risk of heart disease or cancer (yes/no) and belief that overweight affects health (yes/no). The authors compared the proportion of students who endorsed these beliefs pre- and post-intervention.

As a secondary outcome, the program's effect on participants' weight as measured by BMI percentile-for-age before and after

intervention was assessed. BMI percentile (age and sex specific) was calculated for each student using directly measured weight and height. Trained research assistants weighed HS and ES students to the nearest 0.01 kg using a beam balance scale (Detecto) pre- and post-intervention. Height was measured to the nearest 1 mm using a rigid upright portable stadiometer (Seca 214). Students removed shoes and heavy clothing prior to the height and weight measurements. BMI and BMI percentile for age were calculated using a program available from the Centers for Disease Control and Prevention (CDC).¹⁷

Procedure

The IMPACT curriculum was developed by the investigators and is available by request. Table 1 outlines the curriculum content. The lessons consisted of approximately 20 minutes of physical activities and 40 minutes of a nutrition lesson developed to fit within the North Carolina academic competency goals in math, science, reading, social studies, language arts, and/or healthful living for the 4th grade. Students also had weekly homework assignments that required parent or guardian participation for each lesson. Most nutrition lessons were

Table 1.
IMPACT Curriculum Content

Lesson	Objectives	Physical Activity
MyPyramid for Kids	State the purpose of IMPACT Describe the food groups of MyPyramid	“Dance Domino Effect” (students create dance moves to music)
More MyPyramid for Kids	Assign foods to food groups Use math to create a healthy menu	“Healthy Eating Rhyme” (students make up rhyme and dance)
Reading the Nutrition Label	Learn to read the nutrition label Recognize foods with Winner’s Circle logo (the logo recognizes foods that meet certain nutrition criteria)	“VERB Charades” (students draw cards with various physical activities that they must act out)
Eating Healthy Eating Out	Choose healthy fast food alternatives Use math to evaluate nutrition value of meal	“Follow the Fitness Leader” (with music playing, each student leads the class in some form of physical activity for one minute each)
Fill Up on Fruits and Veggies	Describe the benefits of eating produce Evaluate current fruit and vegetable intake	“Rock, Paper, Scissors Tag” (modified version of tag)
Grow Tall and Strong	Evaluate nutrition content of dairy products Select healthy calcium-rich foods	“Memory Lane” (teacher calls out activities and students compete together as partners)
SMART Health Goals	Develop specific, measurable, attainable, relevant, and time-bound (SMART) nutrition and physical activity goals	“Keep the Beach Ball Up”
Food and Activity from Around the World	Learn about food customs of other countries Classify cultural foods using MyPyramid	“Hopscotch Without Borders” (variations of hopscotch from around the world)
Commercial Galore	Identify various food advertising strategies Recognize lack of nutrition in most heavily promoted foods Create a bar graph of strategies used on TV	“Travel the Tarheel State/California Dreamin’” (students are “transported” to various locations throughout North Carolina and California where they act out activities they would do there.)
Lifelong Health	List benefits of a healthy, active lifestyle Identify ways to be even healthier	“Triangle Tag” (variation of tag)
Healthy Me Scrapbook 1 & 2	Demonstrate how students have made healthier choices since beginning the IMPACT program by taking photographs of themselves being healthy and organizing the photographs on a “Healthy Me” posterboard	“Jewel Thieves” (variation of tag) “Invent-a-Game” (students are given 20 pieces of sports equipment and given the task to invent a game in small groups)

adapted from preexisting curricula such as MyPyramid for Kids¹⁸ while many physical activities were adapted from CDC's VERB materials.¹⁹

The IMPACT pilot school-based intervention consists of two parts: a 15-hour extracurricular HS student training and a 12-week classroom-based 4th grade curriculum. Study authors Muth and Chatterjee as well as medical students conducted the HS training over three school holidays in the fall of 2005. The trainings consisted of four components: (1) at least 30 minutes of physical activities; (2) a HS-specific nutrition/activity lesson adapted from the California LEAN project;²⁰ (3) practice teaching sessions; and (4) classroom management and public speaking development exercises. As an incentive, each HS student received a free membership to a local athletic club for the duration of the seven-month intervention.

From January-April 2006, the ES portion of the IMPACT curriculum was implemented. Trained HS students, medical students, and the regular ES teachers delivered the IMPACT lessons to the two 4th grade intervention classrooms for one hour per week over the course of 12 weeks. Study authors Muth and Chatterjee were present at each of the lessons and participated in the lesson instruction. Control classrooms received the usual health education materials and none of the IMPACT materials.

Data Analysis

Questionnaires and height/weight data were entered manually into a Microsoft Excel database and exported to Stata 8.0 for analysis. For HS students, the authors examined baseline characteristics and then compared pre- and post-intervention dietary behaviors, physical activity behaviors, dietary knowledge, and diet/activity attitudes using t-tests and tests of equality of proportions for each variable as appropriate.

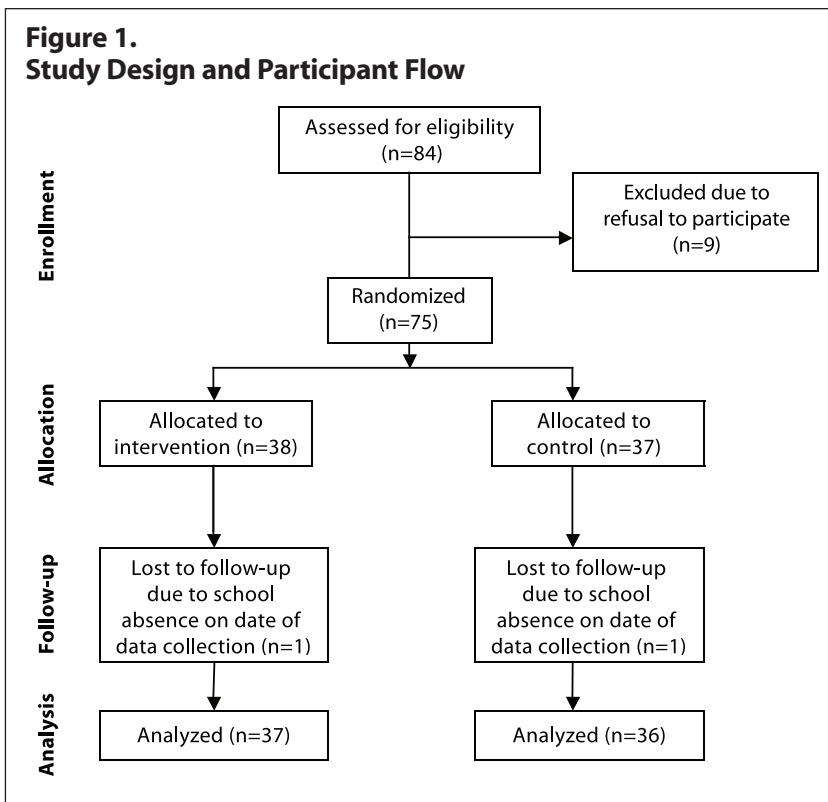
For ES students, baseline characteristics in the intervention and control groups were compared using t-tests and chi-square tests as appropriate for continuous and categorical variables. Distributions of the outcome variables of interest were examined for skew; for normally distributed outcome variables, only means are presented. The authors hypothesized that the intervention might affect multiple dependent variables (dietary behaviors, physical activity behaviors, dietary knowledge, and attitudes). The analysis therefore included estimation of a separate regression equation for each individual dependent variable of interest. Separate linear regression equations were used to estimate the pre-post intervention change in each dependent variable. Group (intervention or control) was the independent variable in each regression. Since the authors' hypothesis was that age, sex, and BMI percentile could affect each dependent variable, these were included as covariates in all regressions, as was the

pre-intervention (baseline) value of each dependent variable. The authors expected that secular changes in the control group could affect dependent variables during the time period under study. Therefore, changes in the intervention group compared with the control group were examined; the relative pre-post intervention differences after adjustment for covariates are reported. All ES students were analyzed according to an intention-to-treat model in which participants were analyzed in the group to which they were assigned (intervention or control).

RESULTS

Elementary School Students

Overall pilot study design is shown in Figure 1. Among the ES students, 38 students from the intervention classrooms (90% of 42 eligible students) and 37 students from the control classrooms (88% of 42 eligible students) participated. Students not given parental consent to participate (n=9) were excluded. Baseline characteristics were similar among the ES intervention and control groups except for BMI percentile, which was higher in the intervention group (see Table 2). Follow-up data were collected from 97% of both the intervention and control ES



groups. Lack of follow-up data was due to absence from school the day the data were collected.

After controlling for sex, age, BMI percentile, and baseline value of dependent variables, ES students in the intervention group reported increased daily fruit and vegetable servings (from 2.3 to 2.7), while students in the control group decreased from 2.6 to 2.2 servings ($p=0.05$) (see Table 3). Compared with the control group, the intervention group also had increased

Table 2.
Baseline Characteristics in Elementary School Students

Characteristic	Intervention (n=38)	Control (n=37)	P-value
Age (years)	9.96	9.83	0.27
Gender (percent)			0.90
Female	47.0	46.0	
Male	53.0	54.0	
Ethnicity (percent)			0.46
White	66.0	68.0	
African American	11.0	11.0	
Hispanic	8.0	8.0	
American Indian	3.0	8.0	
Asian	0.0	3.0	
Other	13.0	3.0	
Mean BMI for age (percent)	70.2	60.3	0.05

intake of calcium-rich foods (+0.7 servings/day after adjustment; $p=0.07$) and grain intake (+0.7 servings/day after adjustment; $p=0.08$). The proportion of students who knew which food group most servings should come from increased significantly in the intervention group (0.4 to 0.5) compared with the control group (0.4 to 0.3; $p=0.01$). Compared to the control group, the intervention group did not have statistically significant changes in other measures including physical activity behaviors, sedentary behaviors, dietary attitude, or BMI percentile for age. In the follow-up survey, no students in the intervention group correctly answered the number of fruits and vegetables that should be consumed daily; the recommended number was the answer choice with the most servings.

High School Students

All HS students were female and either white (89%) or African American (11%); mean BMI percentile for age was 44.2%. Of the nine participating HS students, eight (89%) completed the post-intervention questionnaire. Although the HS sample for this pilot study was small and precluded detection of many statistically significant changes, we did observe nonsignificant dietary behavior changes similar to those in ES students (see Table 4). HS students reported increases in the daily servings of calcium-rich foods (1.9 to 2.5; $p=0.22$), daily servings of grains per day (2.3 to 2.9; $p=0.17$), daily servings of wheat bread (0.3 to 1.1; $p=0.02$), and daily servings of fruits and vegetables (1.3 to 1.9; $p=0.23$). The HS students also reported decreases in daily servings of white bread (1.1 to 0.6; $p=0.10$), sweetened beverages (1.9 to 1.3; $p=0.17$), french fries and chips (0.8 to 0.5; $p=0.35$), and sweets (0.5 to 0; $p=0.10$). No consistent pre-post intervention differences in HS students' dietary knowledge, physical activity behaviors, sedentary behaviors, diet/activity attitudes, or BMI percentile were detected. Attempts were made to collect qualitative

feedback from the HS students about their experience, but the authors received little substantive feedback.

DISCUSSION

This pilot study evaluated the effects of a healthy diet and activity curriculum embedded within the traditional school day on the behaviors, knowledge, and attitudes of HS and ES students in rural North Carolina schools. ES students who received the 12-week IMPACT curriculum reported some improvements in dietary behaviors and knowledge when compared with students who did not participate in the curriculum. It is especially encouraging that students who participated in the IMPACT curriculum reported increased intake of fruits, vegetables, and calcium-containing foods, since these changes were emphasized in the curriculum. Increases in these food groups were modest (e.g. an unadjusted mean increase

of approximately 0.5 fruit and vegetable servings/day in the intervention group). Nevertheless, even modest individual changes have the potential to improve overall diet and health in larger student populations.

Though intervention students increased fruit, vegetable, and calcium consumption, their dietary attitudes and beliefs did not change. Perhaps the IMPACT curriculum and peer modeling successfully emphasized certain dietary behaviors but did not adequately describe why the behaviors were important. Alternately, it is possible that the survey questions did not accurately assess dietary attitudes or that the 24-hour dietary recall was inaccurate, in which case a lengthier dietary recall instrument such as a three-day food record may have provided more accurate dietary information.

We did not detect significant differences in physical activity among ES students after IMPACT participation. Though about one-third of time was devoted to emphasizing activity in the curriculum, most of the time was spent participating in activity and little formal activity instruction was given. Moreover, the curriculum did not include a substantial family component or an after school component, which may be needed to increase physical activity. Additionally, it may be difficult to detect small changes in physical activity since self-report questionnaire items may have been insufficiently sensitive.

Several characteristics of the IMPACT program facilitated its implementation. Since the curriculum incorporated the standard North Carolina academic competency goals and did not increase classroom time, school administrators and teachers were willing to participate. School leadership and parents were also keenly interested in improving students' diet and activity and their support facilitated introducing this program. Following implementation of the pilot IMPACT program described here, school administrators and teachers from two other North Carolina school districts requested the curriculum.

Table 3.
Differences in Change in Knowledge, Attitudes, and Behaviors from Baseline to Follow-Up for Elementary School Students Participating in IMPACT Pilot Intervention Compared with Control Group

	Baseline		Follow-Up		Adjusted difference ^a	P-value
	Intervention (n=38)	Control (n=37)	Intervention (n=37)	Control (n=36)		
Nutrition behaviors (number servings/day)						
Fruits/vegetables	2.3	2.6	2.7	2.2	0.9	0.05
Calcium-rich foods ^b	2.9	2.6	3.3	2.6	0.7	0.07
Milk	1.9	1.7	1.9	1.5	0.2	0.17
Cheese	0.6	0.7	0.9	1.0	0.1	0.64
Yogurt	0.3	0.3	0.4	0.3	0.2	0.21
Grains ^c	2.2	2.2	3.0	2.4	0.7	0.08
Whole wheat bread	0.5	0.5	0.6	0.5	0.1	0.56
White bread	0.9	0.7	1.0	0.8	0.1	0.25
Rice/pasta	0.4	0.6	0.7	0.7	0.1	0.57
Cereal	0.5	0.5	0.7	0.5	0.2	0.18
Sweetened beverages ^d	2.1	2.1	2.0	2.0	0.2	0.82
Soda	0.4	0.4	0.6	0.4	0.1	0.51
Juice	1.0	1.0	0.7	0.8	-0.1	0.57
Other sugary drinks	0.7	0.7	0.7	0.7	0.1	0.67
Fries/chips	0.6	0.5	0.6	0.7	-0.2	0.29
Sweets	0.6	0.7	0.8	0.6	0.1	0.55
Physical activity behaviors						
Physical activity score ^e	7.2	6.2	7.8	6.7	1.0	0.28
Sedentary activities score ^f	4.6	2.5	4.7	3.1	0.2	0.80
Nutrition knowledge (proportion answering correctly)						
Know food group to eat the most servings	0.4	0.4	0.5	0.3	0.2	0.01
Know food group to eat the least servings	0.8	0.7	0.8	0.7	0.1	0.33
Know recommended number of daily fruit/vegetable servings	0.1	0.2	0	0.2	-0.1	0.01
Attitudes (proportion endorsing belief)						
Believe diet affects heart disease/cancer	0.6	0.5	0.5	0.5	0.0	0.81
Believe overweight affects health	0.6	0.6	0.6	0.5	0.1	0.37

a Adjusted difference is the difference in change for each variable before and after the intervention compared with the control group, after adjustment for sex, age, BMI percentile, and baseline value of dependent variables.

b Sum of daily servings of milk, cheese, and yogurt.

c Sum of daily servings of wheat bread, white bread, rice/pasta, and cereal.

d Sum of daily servings of soda, juice, and other sugary drinks.

e Sum of number of days per week of vigorous physical activity and days of moderate physical activity.

f Sum of daily hours of television, computer, and video game use.

Table 4.
Change in Knowledge, Attitudes, and Behaviors from Baseline to Follow-up in High School Students Participating in IMPACT^a

	Baseline (n=9)	Control (n=37)	P-value
Nutrition behaviors (number servings/day)			
Fruits/vegetables	1.3	1.9	0.23
Calcium-rich foods ^b	1.9	2.5	0.22
Milk	1.3	1.3	1.00
Cheese	0.6	1.0	0.28
Yogurt	0.0	0.3	0.17
Grains ^c	2.3	2.9	0.17
Whole wheat bread	0.3	1.1	0.02
White bread	1.1	0.6	0.10
Rice/pasta	0.9	0.7	0.74
Cereal	0.1	0.3	0.59
Sweetened beverages ^d	1.9	1.3	0.17
Soda	0.6	0.4	0.60
Juice	0.8	0.9	0.73
Other sugary drinks	0.4	0.1	0.35
Fries/chips	0.8	0.5	0.35
Sweets	0.5	0.0	0.10
Physical activity behaviors			
Physical activity score ^e	5.7	5.6	0.90
Sedentary activities score ^f	3.3	2.6	0.14
Nutrition knowledge (proportion answering correctly)			
Know food group to eat the most servings	0.9	0.7	0.34
Know food group to eat the least servings	0.9	0.7	0.27
Know recommended number of daily fruit/vegetable servings	0.6	0.6	1.00
Attitudes (proportion endorsing belief)			
Believe diet affects heart disease/cancer	0.6	0.5	0.81
Believe overweight affects health	0.6	0.6	0.37

a Table represents self-reported nutrition and physical activity behaviors, nutrition knowledge, and health attitudes of teen participants in IMPACT before and after program implementation.

b Sum of daily servings of milk, cheese, and yogurt.

c Sum of daily servings of wheat bread, white bread, rice/pasta, and cereal.

d Sum of daily servings of soda, juice, and other sugary drinks.

e Sum of number of days per week of vigorous physical activity and days of moderate physical activity.

f Sum of daily hours of television, computer, and video game use.

teachers or volunteers could play a similar role in communities without access to medical students.

A novel aspect of the IMPACT program was the involvement of HS students as health educators for ES students. It was hoped that HS students might reinforce their own knowledge and behavior change through teaching. Though the number of HS students in the intervention was small and did not permit detection of many significant changes, encouraging trends among the HS students paralleled findings for the ES students. Like the ES students, HS students reported eating more grains, fruits, vegetables, and foods rich in calcium. Interestingly, the HS students did not improve nutritional knowledge or attitudes. It is possible that the survey did not adequately assess knowledge and attitudes, that we did not effectively influence the teens, or that our sample size was not large enough to detect these differences.

Several logistical issues made the involvement of HS students challenging. Specifically, though the two involved schools were close to each other, HS students still needed to be excused from their own classes to participate, and the same students could not participate each week. The HS students therefore had limited continuity of contact with the ES students, which may have limited their benefits as peer educators. Also evident was substantial variation in HS students' confidence and ability in assisting in 4th grade classrooms. A more rigorous selection process, additional training, and a system of rewards for the HS students could improve this component. Further studies would be needed to distinguish whether reported improvements in dietary behaviors were primarily attributable to peer modeling or to having a specialized nutrition and activity curriculum. Finally, qualitative analyses would be useful to understand the impact of the presenters on the students as well as the overall experience of participants.

Since the IMPACT program has the potential to reach all students within the traditional school day, this approach is promising for other school districts. While medical students provided valuable help in the training and implementation of the curriculum,

Although results from this intervention are encouraging, this study has several limitations. As a pilot project, only four 4th grade classrooms at one school participated. The small sample size limits generalizability to other schools and may have limited our ability to detect differences in some outcomes. Post-hoc power calculations demonstrated that with at least 34 subjects in each arm we had sufficient power to detect a difference of one serving per day in the outcomes which were the main focus of the intervention (daily fruit/vegetable and calcium servings; $p=0.8$, $\alpha=0.05$). However, the number of subjects enrolled may have been insufficient to detect smaller differences in outcomes.

The intervention in this pilot study was directed at classrooms rather than individuals, since we theorized that classroom-level interventions are potentially effective in influencing knowledge and behavior on a large scale. While we acknowledge that classrooms constitute clusters of subjects and that larger confirmatory studies would need to incorporate multiple clusters in randomization and analysis, the aim of the current preliminary study was to evaluate the effects of the pilot program using individual-level analyses. A limitation of this approach is that risk of a type I error is increased. This risk was further increased by testing for multiple hypotheses. Also, we chose to test some additional hypotheses such as whether specific unhealthy diet behaviors decreased, such as daily consumption of sweetened beverages, fries, chips, and sweets. We acknowledge that testing a relatively large number of hypotheses further increases the chance of a type I error. However, since only three of the outcomes that we examined reached statistical significance, the likelihood of actual type I errors in our results appears low. Furthermore, because both control and intervention classrooms were at the same school, it is possible that cross-contamination occurred in which the students in the control classrooms were indirectly influenced by communicating with students from the intervention classrooms. This would have led to underestimation of differences between the intervention and control groups, which may have been greater than detected here. Finally, the baseline difference in BMI percentile limits the comparability of these groups.

While the evaluation tools used for the intervention have been validated and are age-appropriate, most of the measures collected were self-reported and subjective and were not associated with improvement in objective outcomes such as BMI percentile. Students in the intervention group may have reported improvements in behaviors in order to provide socially desirable responses. Anecdotally, however, several parents of children in the intervention group reported that their children were making healthy changes such as requesting whole grain bread instead of white bread and being more willing to eat vegetables at dinner.

Another limitation of the intervention is that it lasted only 12 weeks. Ideally, the IMPACT intervention would be incorporated into the school curriculum and reinforced throughout the school year. A longer-term study and follow-up would better gauge the effectiveness and long-term effects of the program.

With the preponderance of poor nutrition and physical activity behaviors among North Carolina's youth, schools need innovative ways to incorporate lessons about healthy habits into the preexisting curricula. The IMPACT curriculum is a promising program that can be adopted by school districts and counties to help children and teens develop healthy lifestyles. **NCMJ**

Acknowledgments: The authors would like to thank Barbara Heffner, Trisha White, MD, and the North Carolina Schweitzer Fellowship Program for their unwavering support of the project. A special thank you to the Triangle SportsPlex in Hillsborough for donating passes and memberships to the IMPACT students, to principals Sherron Leplin and Gary Thornburg and associate principal Freda Hicks in Orange County Schools for the welcome invitation to work with their students, and to Diane Rucker for helping to recruit teen leaders from her health occupation classes.

Funding Source: The IMPACT program received financial support from the American Medical Association Medical Student Section Chapter Involvement Grant, the University of North Carolina Parents' Fund, the Seagraves Grants, and the University of North Carolina School of Medicine Alumni Loyalty Fund.

REFERENCES

- 1 North Carolina Department of Health and Human Services. NC Nutrition and Physical Activity Surveillance System, 2007. <http://www.eatsmartmovemorenc.com/data/>. Accessed November 9, 2008.
- 2 Lobstein T, Baur L, Uauy R. Obesity in children and young people: a crisis in public health. *Obes Rev.* 2004;5(suppl 1): 4-104.
- 3 Serdula MK, Ivery D, Coates RJ, Freedman DS, Williams DF, Byers T. Do obese children become obese adults? A review of the literature. *Prev Med.* 1993;22:167-177.
- 4 US Department of Agriculture. Continuing Survey of Food Intakes by Individuals, 1994-96. <http://www.ars.usda.gov/Services/docs.htm?docid=14392>. Accessed November 9, 2008.
- 5 North Carolina Department of Public Instruction and Department of Health and Human Services. NC Youth Risk Behavior Surveillance Survey, 2007. <http://www.nchealthy schools.org/data/yrbs/>. Accessed July 21, 2008.
- 6 North Carolina State Center for Health Statistics. 2006 Child Health Assessment and Monitoring Program (CHAMP). <http://www.schs.state.nc.us/SCHS/champ/results.html>. Accessed July 21, 2008.
- 7 Sharma M. School-based interventions for childhood and adolescent obesity. *Obes Rev.* 2006;7(3):261-269.
- 8 Shaya FT, Flores D, Gbarayor CM, Wang J. School-based obesity interventions: a literature review. *J Sch Health.* 2008;78:189-196.

- 9 Institute of Medicine of the National Academies. Schools fact sheet: communities can play a role in preventing childhood obesity. <http://www.iom.edu>. Accessed August 18, 2007.
- 10 Robinson TN, Kilen JD, Kraemer HC, et al. Dance and reducing television viewing to prevent weight gain in African-American girls: The Stanford GEMS pilot study. *Ethn Dis*. 2003;13(suppl 1):S165-S177.
- 11 Sallis F, McKenzie TL, Alcaraz JE, et al. The effects of a 2-year physical education program (SPARK) on physical activity and fitness in elementary school students. *Am J Public Health*. 1997;87:1328-1334.
- 12 Bandura A. *Social Foundation of Thought and Action*. Englewood Cliffs, NJ: Prentice-Hall; 1986.
- 13 Mellanby AR, Rees JB, Tripp JH. Peer-led and adult-led school health education: a critical review of available comparative research. *Health Educ Res*. 2000;15:533-545.
- 14 Audrey S, Holliday J, Campbell R. It's good to talk: adolescent perspectives of an informal, peer-led intervention to reduce smoking. *Soc Sci Med*. 2006;63(2):320-334.
- 15 Stephenson JM, Strange V, Forrest S, et al. Pupil-led sex education in England (RIPPLE Study): cluster-randomised intervention trial. *Lancet*. 2004;364:338-346.
- 16 Hoelscher DM, Day RS, Kelder SH, Ward JL. Reproducibility and validity of the secondary level School-Based Nutrition Monitoring student questionnaire. *J Am Diet Assoc*. 2003;103:186-194.
- 17 Centers for Disease Control and Prevention. A SAS Program for CDC Growth Charts, 2007. <http://www.cdc.gov/nccdphp/dnpa/growthcharts/resources/sas.htm>. Accessed September 18, 2007.
- 18 US Department of Agriculture, Food, and Nutrition Service, Team Nutrition. MyPyramid for kids classroom materials, 2005. <http://teammnutrition.usda.gov/resources/mypyramidclassroom.html>. Accessed August 18, 2007.
- 19 Centers for Disease Control and Prevention, Youth Media Campaign. Materials for tweens, 2005. <http://www.cdc.gov/youthcampaign/materials/tweens/index.htm>. Accessed August 18, 2007.
- 20 California Project LEAN. *Jump Start Teens—Lesson Plans*. <http://www.californiaprojectlean.org>. Accessed August 18, 2007.

Instructions for Authors

Unsolicited manuscripts containing original material are accepted for consideration if neither the article nor any part of its essential substance, tables, or figures has been or will be published or submitted elsewhere before appearing in the *Journal*.

All unsolicited manuscripts submitted for peer-review must contain a brief structured abstract including the following (when relevant): Objective; Study Design; Data Source(s)/Study Setting; Data Collection Methods; Intervention; Principal Findings; Limitations; Conclusions; Relevance. Papers submitted without a structured abstract may be considered incomplete and returned to the author.

Submit the cover letter and article (via email attachment) containing the double-spaced text in Microsoft Word. The letter should indicate that the article is not under consideration for publication elsewhere and has not previously been published in any form.

For more information visit our website: <http://www.ncmedicaljournal.com>

North Carolina Medical Journal
 630 Davis Drive, Suite 100
 Morrisville, NC 27560
 919.401.6599 ext. 25
 919.401.6899 fax
 ncmedj@nciom.org

M North Carolina
MEDICAL JOURNAL

Control of Blood Pressure in North Carolina Primary Care: Baseline Data from the GLAD Heart Trial

Erica L. Rosenberger, MS; David C. Goff, Jr., MD, PhD; Cralen C. Davis, MS; Caroline S. Blackwell; Alain G. Bertoni, MD, MPH

Abstract

Background: In general, adherence to blood pressure guidelines is low. We assessed whether hypertension recognition and control in North Carolina was consistent with the seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) in primary care practices participating in a quality improvement study regarding the implementation of the ATP3 cholesterol management guideline in primary care in North Carolina (GLAD Heart).

Methods: Demographic and clinical data were abstracted from 5,073 charts (patients aged 21-84 years, seen from June 1, 2001 to May 31, 2003) at 60 practices. Sites were non-university based primary care practices from 22 North Carolina counties. A dyslipidemia screening was defined as a lipid profile performed when not on lipid-lowering therapy. Among patients receiving a lipid profile, the proportion with diagnosed, undiagnosed, and controlled hypertension, was calculated according to JNC 7 guidelines. Practice level hypertension control was examined using the median and interquartile range across practices.

Results: Among 1,763 patients screened for dyslipidemia, 49.4% had diagnosed hypertension. Only 67 individuals (3.8%) had undiagnosed hypertension. Although 85.8% of hypertensive patients were treated, the median proportions of patients with blood pressure below goal (<140/90, <130/80 with diabetes) was 33.3% (21.8% - 43.7%), with women more likely to be controlled and individuals treated by a solo provider less likely to be controlled.

Limitations: These data were abstracted from the charts of patients who received a lipid profile; therefore, they are only generalizable to individuals who are screened for hyperlipidemia.

Conclusions: There remains a need to improve hypertension management in North Carolina primary care among patients screened for hyperlipidemia.

Keywords: blood pressure; primary health care; risk factors

Hypertension is a strong and prevalent risk factor for cardiovascular disease (CVD). From 1999-2002, 30% of American adults had hypertension,¹ which represents a significant public health burden, as CVD is the leading cause of death in the United States. Approximately 37% of individuals with hypertension are unaware of their condition.² Elevated blood pressure is the leading diagnosis patients receive from their primary care provider (PCP) and accounts for 12 million office visits per year.³ Current blood pressure guidelines were released

in 2003 in the seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7).⁴ The opportunity to measure blood pressure is present at every office visit, but according to the 2003 National Ambulatory Medical Care Survey, blood pressure is only measured at 52.4% of all physician office visits.³ Multiple measurements afford PCPs the opportunity to make frequent decisions regarding management of elevated blood pressure measurements. However studies suggest over two-thirds

Erica L. Rosenberger, MS, is a research associate in the Department of Epidemiology and Prevention in the Division of Public Health Sciences at the Wake Forest University School of Medicine. She can be reached at erosenbe@wfubmc.edu.

David C. Goff, Jr., MD, PhD, is a professor of public health sciences and internal medicine in the Departments of Epidemiology and Prevention and General Medicine in the Division of Public Health Sciences at the Wake Forest University School of Medicine.

Cralen C. Davis, MS, is a biostatistician in the Department of Biostatistical Sciences in the Division of Public Health Sciences at the Wake Forest University School of Medicine.

Caroline S. Blackwell is a project manager in the Department of Epidemiology and Prevention in the Division of Public Health Sciences at the Wake Forest University School of Medicine.

Alain G. Bertoni, MD, MPH, is an associate professor of public health sciences and internal medicine in the Departments of Epidemiology and Prevention and General Medicine in the Division of Public Health Sciences at the Wake Forest University School of Medicine.

of individuals with hypertension have not achieved good blood pressure control.²

Despite widespread dissemination of JNC 7 guidelines, there is evidence that physicians are not following (and may not agree with) the recommendations. In a study by Huse and colleagues, only 60% of internists and 58% of general/family practitioners agreed with 140/90 as a threshold for hypertension.⁵ Oliveria and colleagues surveyed PCPs treating patients with hypertension and found that only 38% of visits resulted in initiation of or changes in medications, despite documented hypertension (>140/90) for at least six months.⁶

The Guideline Adherence for Heart Health (GLAD Heart) Trial is a practice-based, randomized controlled trial designed to test technology-based interventions on adherence to two cardiovascular disease prevention guidelines: the Third Report of the National Cholesterol Education Program's Adult Treatment Panel (ATP3) and the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7). Providers in practices randomized to the ATP3 arm received a personal digital assistant with an ATP3 guideline-based cholesterol management software program. Practices in the JNC 7 arm received automated blood pressure devices. The goal of the current study is to report the levels of recognition and control of hypertension among individuals screened for dyslipidemia in practices recruited for the GLAD Heart Trial.

Methods

The current study consists of patient-level baseline blood pressure data from the GLAD Heart Trial.⁷ Details regarding the recruitment of our sample have been published elsewhere.⁸ Briefly, we recruited 61 primary care practices that were within an approximate three-hour driving radius of Winston-Salem, North Carolina; by design none was located at an academic medical center. Physician and nonphysician providers consented to participate and to have chart abstraction performed at baseline and at follow-up. Patient-level consent for chart review was not deemed necessary by the Wake Forest University Institutional Review Board. We complied with the Health Insurance Portability and Accountability Act (HIPAA) privacy directives.

Practice characteristics were obtained by way of a standard survey administered to participating providers at the initial orientation session and included provider training (internal or family medicine), education (physician, physician assistant, or nurse practitioner), practice size, and provider gender and ethnicity. Practices were considered to consist of predominantly female or minority providers if greater than 50% of providers (including non-physician providers) were women or non-white, respectively. Practices were considered to be urban if they were located in a city or town designated by the United States Census as an urbanized area; otherwise they were categorized as rural.

Data Collection

The Carolinas Center for Medical Excellence abstracted data via chart reviews at 60 of 61 practices (one practice was

not open during the baseline data collection period). Chart abstraction methods are described in detail elsewhere.⁷ In short, a random sample of charts was pulled at each practice and those with a recent lipid profile were abstracted fully. Eligible patients included adults aged 21 through 84 years who had been seen in participating primary care practices from June 2001 to June 2003. Full medical record abstractions were completed on patients who were not on lipid-lowering therapy prior to the data abstraction window and had a lipid profile during the window, as the primary foci of the project were cholesterol screening and management. Data elements collected included demographics (age, gender, race/ethnicity), major comorbidities (coronary heart disease and diabetes), lipid profile values, additional cardiovascular disease diagnoses (stroke, peripheral vascular disease), CVD risk factors (smoking, diagnosed hypertension, antihypertensive medicine prescription, family history of heart disease), lipid-lowering medication, and blood pressures measured before and after the lipid profile.

To assess the intra- and interobserver reliability of the data being abstracted, 14 records per practice were reabstracted. A total of 858 records were abstracted in duplicate including, at baseline, 491 for intra- and 367 for interobserver reliability. Intra- and interobserver agreement was 95.2% and 89.9% respectively.

Definitions

A person was considered to have *diagnosed hypertension* if (1) there was a note in the medical chart regarding a diagnosis of hypertension (HTN, or high blood pressure) or (2) they were prescribed antihypertension medications. We considered a person to have *undiagnosed hypertension* if (1) the two documented blood pressure values were at least 140/90 mmHG and (2) there was no documentation in the medical chart of a hypertension diagnosis or hypertension medications.

Blood pressure readings used in analysis consisted of clinic blood pressure readings taken at the last visit before the lipid profile and the first visit after the lipid profile. Persons with only one blood pressure value during the chart abstraction window could not meet criteria for undiagnosed hypertension; however 74 patients had a documented diagnosis and only one blood pressure value. Blood pressures were considered to be controlled if (1) below 140/90 mmHG in the absence of diabetes or (2) below 130/80 mmHG with diabetes.⁴ JNC 7 guidelines were used to define control, in order to be consistent with baseline feedback given to the providers and the intervention itself.

Data Analysis

Frequencies, proportions, means, and standard deviations were calculated to describe the sample. Sampling weights based on approximations of the total number of patients in each practice were used to provide estimates applicable to the study base of patients receiving care in these practices. Weighted estimates of blood pressure control were calculated for each practice. The median and interquartile range for blood pressure control rates across all practices were computed. Multivariate logistic regression modeling was used to evaluate the relationship between blood pressure control and patient-level and practice-level characteristics.

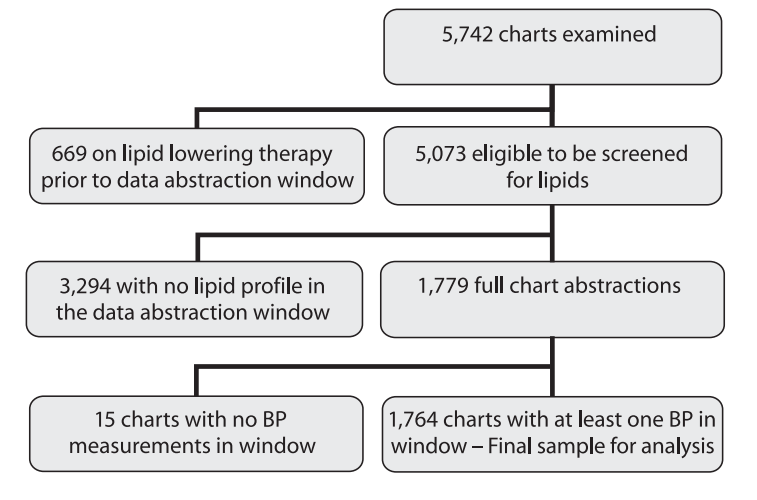
Sampling weights and a specification for clustering by practice were taken into account in all models. We considered the following characteristics: age (in categories of 21-44, 45-64, and 65-84 years), gender, race (non-white/white), diabetes (yes/no), cardiovascular disease (yes/no), solo/group practice, family/internal medicine, majority female/male practice, majority non-white/white practice, and urban/rural practice. Because race was missing from many records, we utilized multiple imputation to assign race for 198 patients. Multiple imputation is a technique whereby multiple simulated analyses are performed; in each analysis the missing data is replaced by plausible values and the results are combined to produce estimates and confidence intervals that account for the missing-data uncertainty.⁹ The patient-level characteristics and minority and solo practice variables were included as covariates in the model after displaying p-values less than 0.05 in unadjusted analyses. Significance was determined using two-tailed tests and an alpha=0.05. All analyses were performed using SAS version 9.1.

Assumptions that are made in the analysis are that the unweighted and weighted estimates are unbiased; the imputation methods preserve an unbiased complete structure of the data; the models are free of colinearity; and our weights and cluster structure give appropriate variance estimates.⁹ In our analyses, sampling weights were constructed to account for the unequal probability of selection of charts due to different screening rates across different practices. The application of sampling weights allows us to make unbiased inference about the target population. We also used a parametric (regression) method to build a multiple imputation model to impute missing data for race. The major underlying statistical assumptions are (1) the missingness of race can depend on the race observed in the dataset, but does not depend on the unobserved values and (2) the parameters of the data model and the parameters of the model for the missing data indicators are distinct.

Results

We obtained chart review data from 60 primary care practices. Most were group practices (mean number of providers=3.6, range 1-14) and were staffed by family medicine providers. Our practices were diverse with respect to provider gender and ethnicity and included both rural and urban practices (see Table 1). A total of 5,742 charts were examined; of these, 5,073 patients were eligible to be screened for lipids. Figure 1 describes the exclusions which led to our final analytic sample of 1,763 patients. Patient demographics and comorbidities are presented in Table 1. Diabetes (prevalence=15.8%, range 0-42%) and heart disease

Figure 1.
Flowchart Outlining Number of Patient Charts Abstracted and Numbers Available for Determination of Hypertension Status and Blood Pressure Control



(prevalence=8.3%, range 0-46%) were common comorbidities among patients in these practices.

Among these patients, 786 (44.6%) were determined to have a diagnosis of hypertension by a notation in their chart and an additional 85 (4.8%) were classified as having hypertension because they were on hypertension medications, yielding a total

Table 1.
Characteristics of Patients and 60 Primary Care Practices in North Carolina in Guideline Adherence for Heart Health

Sample Characteristics	Number (Percent) or Mean (SD)
Sample Size	1,763
Female	985 (55.9%)
Age	51.4 (14.3)
Race	
White	1,140 (64.7%)
African American	175 (9.9%)
Other	40 (2.3%)
Missing	408 (23.1%)
Diabetes Mellitus	278 (15.8%)
Heart Disease	147 (8.3%)
Blood Pressure	130.8/79.8(19.1/11.2)
Hypertension	938 (53.2%)
Practice Characteristics	Number (Percent)
Solo Practice	12 (20%)
Internal Medicine	15 (25%)
Family Medicine	45 (75%)
Rural Location	13 (22%)
Majority Nonwhite Providers	9 (15%)
Majority Female Providers	16 (27%)

Table 2.
Hypertensive Patients by Diagnosis and Treatment Status and Mean Blood Pressure (n=938)

Treatment Status	Number (Percent)	Mean BP
Diagnosed and Treated	799 (85.2%)	139.5/82.8
Diagnosed and Not Treated	72 (7.7%)	127.0/77.3
Undiagnosed and Not Treated	67 (7.1%)	144.3/84.7

of 871 (49.4%) meeting our criteria for diagnosed hypertension. Only 67 individuals (3.8%) had undiagnosed hypertension. Table 2 describes the treatment status of individuals with hypertension. A minority, 14.8%, were not currently prescribed hypertension medications. However, those with a diagnosis who were not treated had a mean blood pressure that was below treatment goal, suggesting nonpharmacologic management may have been prescribed.

The percentage of patients with blood pressure below a common goal (< 140/90mmHG for all patients) at practices performing blood pressure management was 41.2% (23.8-54.7%, median and interquartile range (QR). The proportion of patients under control changes when taking into account the appropriate goal for diabetics. Median (and IQR) percentage of patients with blood pressure below goal (140/90mmHG without diabetes, 130/80mmHG with diabetes) across practices was 33.3% (19.5-50.0%). The substantial variability in hypertension control by practice is demonstrated in Figure 2 based on this more stringent criterion.

Despite an overall mean blood pressure below 140/90mmHG (see Table 1), two-thirds of patients with diagnosed hypertension had uncontrolled blood pressure within the data abstraction window. The mean blood pressure for patients with hypertension under control (by JNC 7 guidelines) was 122.8/74.8 mmHG, whereas the mean blood pressure for those patients with uncontrolled hypertension was 150.5/88.1 mmHG. Among the 484 patients with uncontrolled hypertension, 72.5% had systolic blood pressures between 140 and 159 mmHG, and only 27.5% had systolic blood pressures greater than 160 mmHG. Correlates of blood pressure control are shown in Table 3. Men were less likely to be controlled compared to women (OR = 0.64), however this difference did not reach statistical significance. Patients treated by a provider practicing at a solo practice were less likely to be controlled than those treated at a multiprovider practice. No other patient or practice characteristic was associated with blood pressure control.

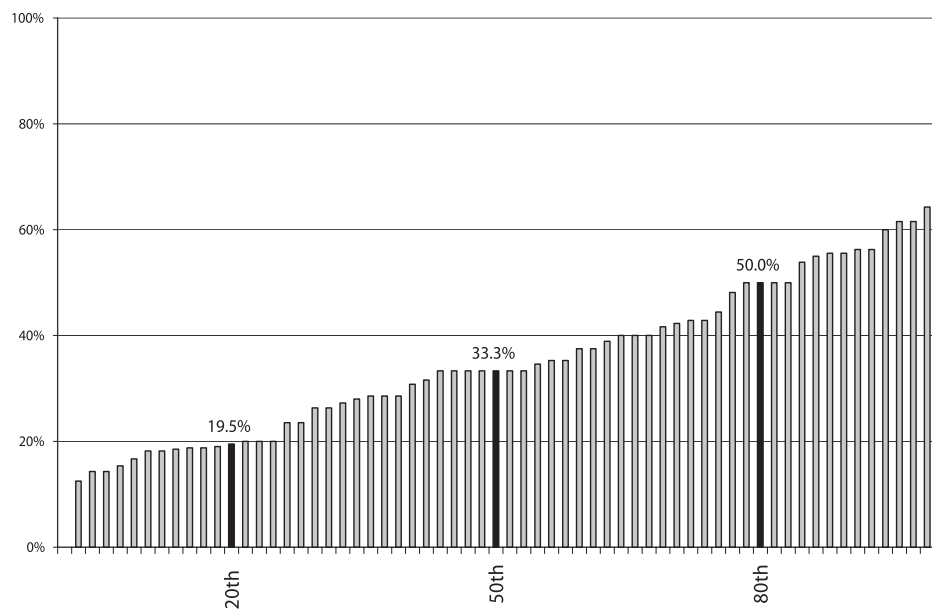
Discussion

In this sample of patients who were screened for dyslipidemia in primary care practices in North Carolina, we found evidence for suboptimal hypertension control. These data suggest there are opportunities for improvement in the diagnosis of hypertension, even among patients who are accessing primary care. Furthermore, despite high treatment rates there is ample

opportunity for improving blood pressure control. Finally, we demonstrate substantial variability in the control of hypertension across practices.

These data are a snapshot of blood pressure control around the time of lipid management, and several limitations should be noted. We did not record the number of antihypertensive medications, nor the doses, and thus cannot comment on the intensity of treatment. We also did not obtain multiple blood pressure readings over time, which may have revealed lowered blood pressure with further follow-up. On the other hand, our data come from practices that agreed to participate in a quality improvement program; these practices may have had better care, on average, than general medical care in these communities. Patient level data was not linked to specific

Figure 2.
Proportion of Patients with Hypertension Who Were Controlled (Blood Pressure <140/90 mmHG except <130/80 if Diabetic) at Each Practice, Ordered Left to Right from Lowest to Highest Performance



Solid Black Bars and Values Above Them Indicate the 25th, 50th, and 75th Percentiles.

providers within practices. While not ideal, randomization was at the practice level and the number of patients from each practice was too low to differentiate by provider. Despite these limitations, our findings are consistent with other reports.

In studies assessing management of hypertension in primary care, reported rates of blood pressure control across the United States range from 23% to 54%.¹⁰⁻¹² Control rates from the most recent National Health and Nutrition Examination Survey (NHANES) were 36.8% nationwide.¹³ We found, however, few data regarding hypertension treatment and control specifically in North Carolina. According to the Behavioral Risk Factor Surveillance System (BRFSS) survey, in 2005, 29.2% of North Carolinians said they had been told by a health professional that they had high blood pressure, and 77.4% of those with hypertension were currently taking medication for it.¹⁴ This survey only reports prevalence of self-reported hypertension, however, and does not include data regarding control.

Most of the literature assessing control of blood pressure has not considered the impact of the lower blood pressure goals for persons with diabetes or renal disease. We did not have measures of renal function or abstract renal insufficiency as a comorbidity. However, as the prevalence of diabetes was substantial in this population, the proportion controlled are significantly lower when taking into account diabetes. The poor control of blood pressure in persons with diabetes in this study is consistent with other reports.¹⁵

Given the significance of hypertension as a public health problem in the United States and the many clinical trials that have demonstrated the efficacy of blood pressure control in reducing CVD events,¹⁶ efforts to improve the diagnosis and control of hypertension should be a health care quality improvement priority. Furthermore, improved hypertension control in a state with a high stroke and heart disease incidence would likely yield meaningful reductions in the burden of CVD in the population. **NCMJ**

Table 3.
Classification of Patients Based on Final Blood Pressure Abstracted (Goal 140/90 or 130/80 for Diabetic Patients)

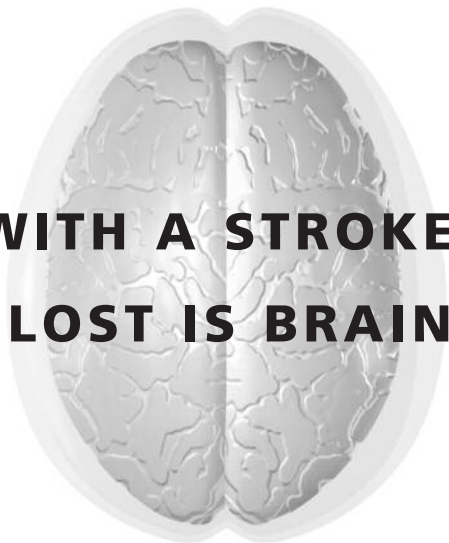
	Percent Controlled	OR For Control*
Overall	33.9%	
Age Groups		
21-44	41.5%	1.57 (0.93, 2.64)
45-64	31.8%	1.04 (0.64, 1.70)
65-84	33.4%	Ref
Gender		
Male	28.6%	0.64 (0.40, 1.01)
Female	38.0%	Ref
Race		
White	34.2%	Ref
Non-white	35.2%	0.86 (0.39, 1.89)
Diabetes		
Yes	27.3%	1.45 (0.72, 2.91)
No	36.0%	Ref
CHD		
Yes	36.7%	0.73 (0.32, 1.70)
No	33.5%	Ref
Minority Practice		
Yes	44.6%	2.05 (0.98, 4.30)
No	32.3%	Ref
Solo Practice		
Yes	22.2%	0.47 (0.30, 0.75)
No	34.6%	Ref

*Odds ratios are weighted.

REFERENCES


- Centers for Disease Control and Prevention. *Preventing Heart Disease and Stroke: Addressing the Nation's Leading Killers, 2005*. Washington, DC: US Dept of Health and Human Services; 2005.
- Thom T, Haase N, Rosamond W, et al. Heart disease and stroke statistics—2006 update: a report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation*. 2006;113(6):85-151.
- Hing E, Cherry DK, Woodwell BA. *National Ambulatory Medical Care Survey: 2003 Summary*. Washington, DC: US Dept of Health and Human Services; 2005. National Center for Health Statistics Report 365.
- 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):2560-2571.
- Huse DM, Roht LH, Alpert JS, Hartz SC. Physicians' knowledge, attitudes, and practice of pharmacologic treatment of hypertension. *Ann Pharmacother*. 2001;35(10):1173-1179.
- Oliveria SA, Lapuerta P, McCarthy BD, L'Italien GJ, Berlowitz DR, Asch SM. Physician-related barriers to the effective management of uncontrolled hypertension. *Arch Intern Med*. 2002;162(4):413-420.

- 7 Bertoni AG, Bonds DE, Steffes S, et al. Quality of cholesterol screening and management with respect to the National Cholesterol Education's Third Adult Treatment Panel (ATPIII) guideline in primary care practices in North Carolina. *Am Heart J.* 2006;152(4):785-792.
- 8 Ellis SD, Bertoni AG, Bonds DE, et al. Value of recruitment strategies used in a primary care practice-based trial. *Contemp Clin Trials.* 2007;28(3):258-267.
- 9 Rubin DB, Schenker N. Multiple imputation in health-care databases: an overview and some applications. *Stat Med.* 1991;10(4):585-598.
- 10 Jackson GL, Edelman D, Weinberger M. Simultaneous control of intermediate diabetes outcomes among Veterans Affairs primary care patients. *J Gen Intern Med.* 2006;21(10):1050-1056.
- 11 Spranger CB, Ries AJ, Berge CA, Radford NB, Victor RG. Identifying gaps between guidelines and clinical practice in the evaluation and treatment of patients with hypertension. *Am J Med.* 2004;117(1):14-18.
- 12 Ornstein SM, Nietert PJ, Dickerson LM. Hypertension management and control in primary care: a study of 20 practices in 14 states. *Pharmacotherapy.* 2004;24(4):500-507.
- 13 Ong KL, Cheung BM, Man YB, Lau CP, Lam KS. Prevalence, awareness, treatment, and control of hypertension among United States adults 1999-2004. *Hypertension.* 2007;49(1):69-75.
- 14 North Carolina State Center for Health Statistics. 2005 BRFSS survey results: North Carolina. <http://www.schs.state.nc.us/SCHS/brfss/>. Accessed November 12, 2008.
- 15 Saydah SH, Fradkin J, Cowie CC. Poor control of risk factors for vascular disease among adults with previously diagnosed diabetes. *JAMA.* 2004;291(3):335-342.
- 16 Staessen JA, Li Y, Thijs L, Wang JG. Blood pressure reduction and cardiovascular prevention: an update including the 2003-2004 secondary prevention trials. *Hypertens Res.* 2005;28(5):385-407.




**WITH A STROKE,
TIME LOST IS BRAIN LOST.**

Learn the warning signs at
StrokeAssociation.org or 1-888-4-STROKE.



©2004 American Heart Association
Made possible in part by a generous grant from The Bugher Foundation.

**American Stroke
Association**
A Division of American
Heart Association 

Epidemiology of Respiratory Syncytial Virus in Various Regions Within North Carolina During Multiple Seasons

David A. Wilfret, MD; Brent T. Baker, MD; Elizabeth Palavecino, MD; Cassandra Moran, DO; Daniel K. Benjamin Jr., MD, PhD

Abstract

Background: The Centers for Disease Control and Prevention (CDC) monitors the occurrence of respiratory syncytial virus (RSV) in the United States and has historically reported on activity at the regional level. Prior to the 2007-2008 RSV season, the CDC did not report seasonal RSV data for cities within North Carolina or for the state. The purpose of the present study is to characterize RSV seasonal activity within North Carolina and to determine the appropriate months in which at-risk children should receive prophylaxis.

Methods: We prospectively collected RSV test data monthly over three seasons (fall through spring), from September 2003 through July 2006, from a diverse group of hospitals and a community pediatric practice located within five regions throughout North Carolina.

Results: Approximately 14,000 laboratory tests, including 23.7% that were RSV positive, were evaluated over the three seasons, and RSV was detected within the state during all but three months of the study. Seasonal variation in the onset (October-November) of RSV activity and duration (six to seven months) of the RSV season according to the specified definition of seasonality was noted yearly within individual regions and among regions. On average over the study period, the greatest percentage of positive tests (33.8%) statewide occurred during January.

Conclusions: Our data suggest the RSV season in North Carolina is longer than the national average, and RSV epidemics persist during months that fall outside of those in which RSV prophylaxis is given to high-risk children. Guidelines on the administration of RSV prophylaxis should ideally be based on results of local RSV test data.

Keywords: respiratory syncytial virus (RSV); surveillance; seasonality; palivizumab; North Carolina

Respiratory syncytial virus (RSV) is a major cause of lower respiratory tract infections among young children¹ and is responsible for more hospitalizations—approximately 2.4 per 100 births yearly—than any other disease during infancy.^{2,3} RSV affects nearly all children at least once by age 2.⁴ Those born prematurely or with either a history of chronic lung disease or significant congenital heart disease are at highest risk for severe disease.⁵ Potential consequences of RSV-related infection include recurrent wheezing and asthma through later life⁶ and deaths.⁷ This underscores the need for adequate preventive measures. There are no vaccines currently available against RSV, but the severity of infection and likelihood for hospitalization are reduced in at-risk children who are administered palivizumab prior to and during the RSV season.^{5,8,9}

Recommendations on the use of palivizumab are issued periodically by the Committee on Infectious Diseases and published in the Redbook.⁵ The most current guideline states that palivizumab should be administered as a series of five monthly injections beginning in November and ending in March. However, these recommendations do not take into consideration the substantial seasonal variability in the onset and duration of RSV epidemics noted over time within a given geographic area or among different regions of the country.¹⁰ The Centers for Disease Control and Prevention (CDC) has monitored temporal and geographic trends for RSV activity through a passive surveillance system (i.e., National Respiratory and Enteric Virus Surveillance System [NREVSS]) that includes approximately 70 laboratories located throughout the

David A. Wilfret, MD, is a research fellow in the Department of Pediatrics at Duke University Medical Center.

Brent T. Baker, MD, is a pediatrician for the North Carolina Respiratory Syncytial Virus Study Team.

Elizabeth Palavecino, MD, is a medical microbiologist for the North Carolina Respiratory Syncytial Virus Study Team.

Cassandra Moran, DO, is an instructor in the Department of Pediatrics at Duke University Medical Center.

Daniel K. Benjamin Jr., MD, PhD, is an associate professor in the Department of Pediatrics at Duke University Medical Center. He can be reached at danny.benjamin@duke.edu.

country. Results of RSV test data from participating sites for the 2003 through 2006 RSV seasons were grouped into one of four regions, and seasonal data were reported by region and not state, with the exception of Florida.¹¹ There has been increased interest by individual state departments of health^{12,13} and independent investigators¹⁴⁻¹⁷ to gain a better understanding of the seasonality of RSV at the local level and to place less reliance on regional data. As a result, more than 20 state health departments have some form of RSV surveillance program. Recognizing the need for better reporting of local data, the number of reporting laboratories within the NREVSS has been greatly expanded and state data are currently available (i.e., as of the 2007-2008 RSV season) through the network. At the time of our study, North Carolina did not have any formal coordinated RSV monitoring program, and to our knowledge there were no available published data on the seasonality of RSV within the state. The purpose of this study was to identify when RSV was present in epidemic levels within different regions of the state over time and to determine the appropriate timing and duration of RSV prophylaxis specific to North Carolina.

METHODS

We prospectively collected RSV test data monthly from children over three seasons (fall through spring), beginning September 2003 and ending July 2006 from a diverse group of academic and community hospitals and a group of pediatric primary care offices. The purpose of the study was to determine the onset, peak, duration, and conclusion of each RSV season within various regions of the state and in the state overall. A further objective was to determine appropriate timing and duration of palivizumab prophylaxis specific for North Carolina.

Laboratory tests from patients were reported monthly and the number of positive tests was divided by the total number of tests to determine the percent of positive tests by region and for the state. The onset of the RSV season was defined as the first of consecutive months in which 10% or more of RSV tests were positive and at least 10 tests were reported. If fewer than 10 tests were reported, RSV was considered not to be present during the month. The conclusion of the RSV season was defined as the first month following successive epidemic months in which <10% of tests were positive or fewer than 10 tests were noted. To simulate real-life conditions, each site used its own collection and testing methods and made its own determination as to which patients would be tested. Presence of RSV was confirmed through antigen detection methods such as virus direct fluorescent assay (VDFA) and enzyme immunoassay (EIA) and/or viral culture. Antigen detection assays, rather than viral cultures, were used to determine the RSV season, as viral culture results were only available from one site. Data were submitted and analyzed at the Duke Clinical Research Institute.

The participating institutions included academic and community hospitals and a group of pediatric primary care offices, which represented five regions within the state. Sites included Wake Medical Center (now known as WakeMed) in

Raleigh (north central North Carolina); four sites in Greensboro/Winston-Salem (northwestern North Carolina), which included Baptist Medical Center, Forsyth Medical Center, High Point Regional Hospital, and Moses H. Cone Memorial Hospital; Pitt County Memorial Hospital in Greenville (eastern North Carolina); Carolinas Medical Center in Charlotte (southwestern North Carolina); and three sites of Hendersonville Pediatrics located in Brevard, Fletcher, and Hendersonville (western North Carolina). The populations of the study areas are quite variable, representing urban (200,000-650,000 people; Winston-Salem, Greensboro, Raleigh, Charlotte), suburban (72,000 people; Greenville), and rural locales (5,000-15,000 people; Fletcher, Brevard, Hendersonville). The farthest distance spanning any two sites exceeds 300 miles, between Brevard and Greenville; the closest distance, between Baptist Medical Center and Forsyth Medical Center, is approximately three miles.

Data from Forsyth Medical Center, High Point Regional Hospital, Moses H. Cone Memorial Hospital, and Baptist Medical Center were pooled as one regional site (Greensboro/Winston-Salem), as were data from all sites of Hendersonville Pediatrics. Wake Medical Center and the four sites in Greensboro/Winston-Salem reported data throughout each of the three study seasons: 2003-2004, 2004-2005, and 2005-2006. Pitt County Memorial Hospital collected data through two seasons (2003-2004 and 2004-2005), whereas Carolinas Medical Center and Hendersonville Pediatrics reported data for a lone season each (2003-2004 and 2005-2006, respectively).

RESULTS

Approximately 14,000 RSV test results were reported during the evaluation period and almost 80% of all data were contributed from the Greensboro/Winston-Salem and Wake Medical Center sites. All patients were children, but further demographic data (i.e., ages, gender, race) were not available. Seasonal variation in the onset of RSV activity, month of peak activity, and duration of the RSV season was noted yearly within individual regions and among regions. Collectively, RSV was detected during all but three months, seasons began in the months of October or November, activity peaked between November and February (most often January), and seasons concluded in March, April, or May. Seasons lasted from two to seven months in individual regions and six months statewide during the 2003-2004 and 2004-2005 seasons and seven months statewide during the 2005-2006 season.

Statewide Results

During the three seasons, 13,920 samples were collected overall from five regions across the state, and of these, 3,297 (23.7%) were positive (see Table 1). The month with the most laboratory test reports was December (3,501) although the greatest percentage of positive tests (33.8%) occurred during January. The highest percentage of positive RSV tests occurred during the 2005-2006 season (29.2%), with data for the other two seasons being fairly similar around 21% to 22%.

Table 1.
Percent Positive RSV Tests From All Sites Each RSV Season

Month	2003-2004	2004-2005	2005-2006	Total
September	7.2 (9/125) ^a	1.9 (2/104)	3.4 (2/58)	4.5 (13/287)
October	17.7 (72/407)^b	6.1 (16/263)	9.6 (22/228)	12.2 (110/898)
November	26.3 (187/712)	15.4 (68/441)	27.2 (115/423)	23.5 (370/1576)
December	17.7 (304/1722)	32.8 (248/757)	40.8 (417/1022)	27.7 (969/3501)
January	29.9 (272/910)	34.3 (309/902)	36.9 (384/1042)	33.8 (965/2854)
February	31.7 (214/675)	20.9 (147/703)	26.6 (174/654)	26.3 (535/2032)
March	14.6 (88/603)	11.4 (58/507)	20.0 (90/449)	15.1 (236/1559)
April	4.3 (12/281)	10.5 (18/171)	15.0 (30/200)	9.2 (60/652)
May	5.3 (5/95)	6.6 (8/122)	11.9 (13/109)	8.0 (26/326)
June	0.0 (0/37)	0.0 (0/9)	5.3 (3/57)	2.9 (3/103)
July	10.0 (2/20)	7.1 (1/14)	10.5 (6/57)	9.9 (9/91)
August	0.0 (0/32)	11 (1/9) ^c	– –	2.4 (1/41)
Total	20.7 (1165/5619)	21.9 (876/4002)	29.2 (1256/4299)	23.7 (3297/13920)

a Numbers in parentheses represent the number of positive samples/total number of tests.

b Numbers in bold represent months in which >10% positive tests and more than 10 samples were reported.

c Fewer than 10 samples reported in this month.

Monthly data tabulated from all regions monitored within the state revealed that the onset of the RSV season occurred either in October or November and ended in March, April, or May. During 2003-2004 and 2004-2005, the RSV season lasted six months and during 2005-2006 was seven months long, beginning in November and ending in May (see Figure 1). Peak months for RSV activity differed annually and included February in the 2003-2004 season, January in the 2004-2005 season, and December in the 2005-2006 season. Overall statewide data yielded a six month RSV season from October through March with peak activity in January (see Figure 1). Of interest, in all three time periods there was a noticeable increase in the percentage of positive RSV tests from June to July including two seasons in which threshold limits were exceeded. It is unclear whether this result is a function of small sample size or high circulating levels of RSV in local communities. Nevertheless, it indicates that RSV is present in North Carolina during months outside of the traditionally-reported season.

Greensboro/Winston-Salem

The four hospitals within this region—Forsyth Medical Center, High Point Regional Hospital, Moses H. Cone Memorial Hospital, and Baptist Medical Center—tested 6,438 samples from inpatients and outpatients, contributing 46.3% of the total. Combined results from all hospitals in this region revealed two RSV seasons lasting six months, beginning in either October or November and concluding in March or April

with a peak in January and a third RSV season of four months with peak activity in January (see Figure 2).

Wake Medical Center

This facility tested 4,565 samples or 32.8% of the total. Results showed six month RSV seasons the first two years, starting in October and concluding in March (see Figure 3). Unfortunately, data for 2004-2005 were not reported for the months April through June; therefore it is possible that this RSV season could have been longer than reported. As with the first two seasons, the 2005-2006 season started in October but was of five months duration as the percent of positive RSV tests dipped to 9.7% in March. In the first season, the peak lasted essentially for two months, spanning January and February. In seasons two and three, peak activity occurred in December (see Figure 3).

Pitt County Memorial Hospital

This hospital contributed 1,139 samples, 8.2% of the total, over two RSV seasons. Data from this site differs from the others in that in both time periods the RSV season was short, lasting three months in 2003-2004, starting in October, and only two months in 2004-2005, beginning in January (see Figure 4).

Carolinas Medical Center and Hendersonville Pediatrics

Sites in these two regions each participated for one season and provided 1,778 or 12.8% of the samples. The Hendersonville practice contributed data for a full year from

three locations and reported a seven-month RSV season during 2005-2006 including three months during which 50% or more of RSV tests were positive, including January, the peak month (see Figure 4). These findings should be interpreted cautiously as the high positivity rates are based on the fewest number of tests (367) per all regions and could also reflect a very strict test screening process. It is difficult to draw conclusions for Carolinas Medical Center as there is no general pattern to their data, which was reported over a period of only eight months.

DISCUSSION

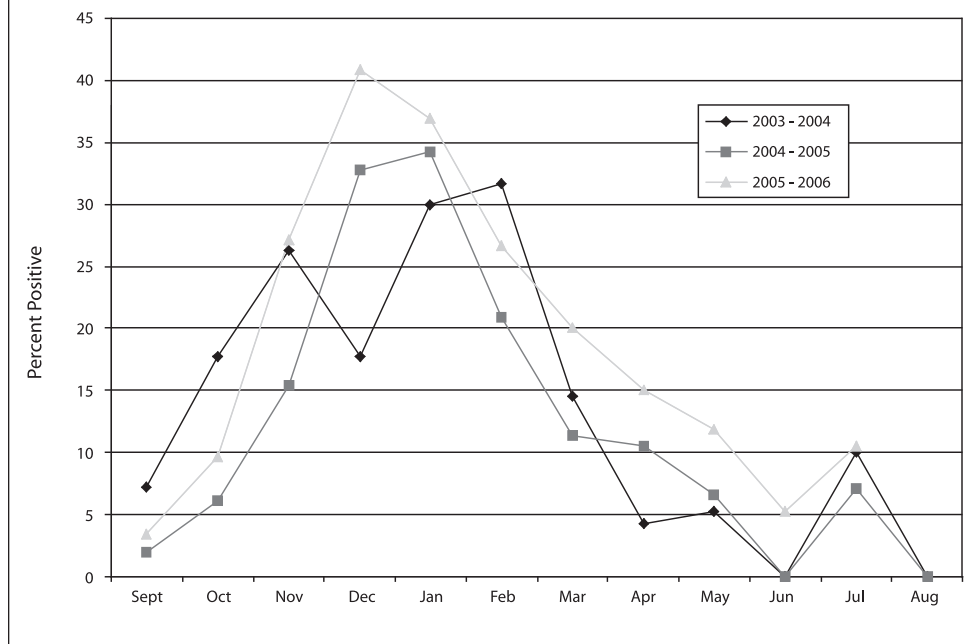
RSV epidemics occur yearly throughout the United States,

and a select group of infants and young children are at increased risk for severe disease and hospitalization. Results of recent studies provide strong evidence that hospitalizations for RSV-related illness parallel RSV virology data reported in the community.^{14,15} At the time of our study, the CDC monitored RSV outbreaks through the NREVSS, which consisted of a limited number of laboratories in North Carolina. Data from participating laboratories in individual states that were part of the NREVSS were arbitrarily grouped into four distinct regions; North Carolina was part of the south reporting region. Analyses of regional data reported by the CDC indicated that the onset and duration of the RSV season varied substantially by year and location.^{10,14}

Data were not available at the state level from the CDC.

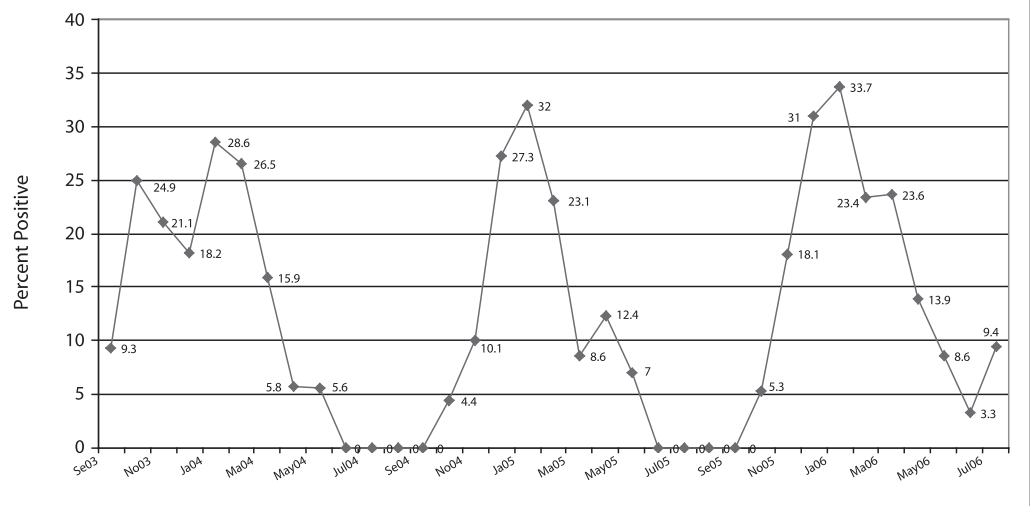
Given the variability in the timing of RSV outbreaks, there has been an increase in RSV surveillance monitoring at the local level.^{15,17} At least 20 state health departments presently have some form of RSV surveillance program.¹² Two states—Florida and Georgia—monitor RSV in several regions within their states and report results on a state-supported website.^{12,13}

Figure 1.
RSV Test Data in North Carolina for Years 2003-2006



The RSV season in both of these states, and in Hawaii^{18,19} and Alaska,¹⁵ is longer than that reported for other parts of the country. The National Respiratory and Enteric Virus Surveillance System (NREVSS) has expanded the network of reporting laboratories, and data for the 2007-2008 RSV season is available for North Carolina (16 reporting laboratories) and other states on the CDC website. Several of the laboratories that are currently within the NREVSS network were included in our study. In contrast to the data now available on the CDC website with NREVSS-reported data for the entire state, our data is regional within North Carolina and statewide. Without knowing the total number of laboratory tests ordered and the

Figure 2.
RSV Test Data for Greensboro/Winston-Salem Study Sites for Years 2003-2006

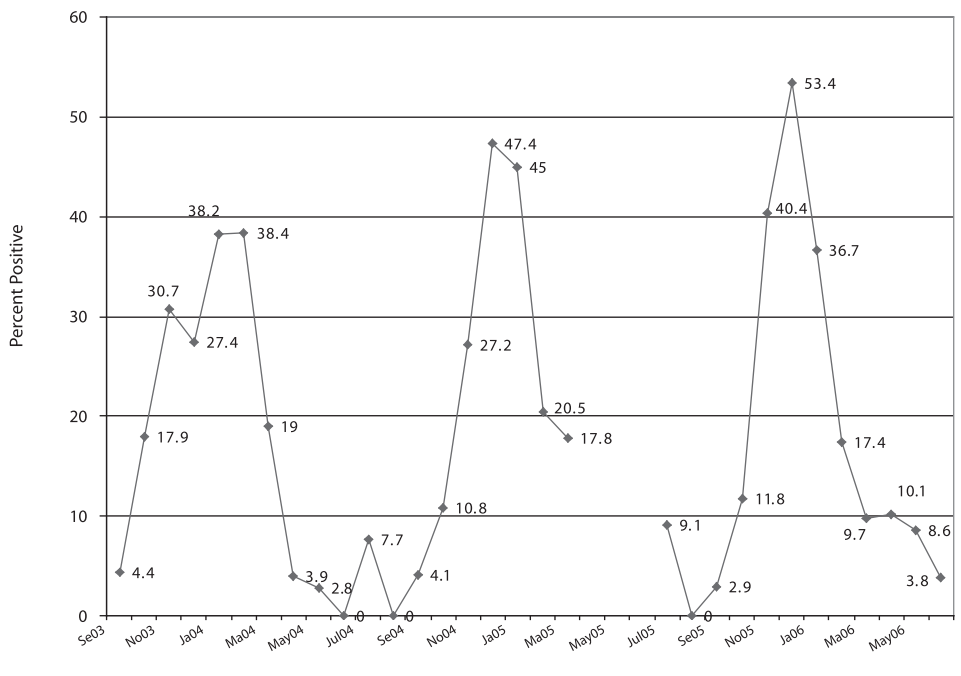


number positive per site, it is possible that there could be inherent biases in the statewide data reported by NREVSS.

In North Carolina, RSV prophylaxis is typically given between November and March and longer if deemed medically necessary by the CDC or a local health department. For the 2007-2008 RSV season, North Carolina Medicaid, the main provider of palivizumab in the state, has approved palivizumab for no more than five monthly doses, while some insurance carriers will reimburse for six doses if that is supported by virology data. Our results suggest that the RSV season in North Carolina during the time of our study was at least six months long, including periods that extended outside of the months recommended by the American Academy of Pediatrics (AAP) for palivizumab administration.

There are inherent strengths and weaknesses to our study. We reported results of almost 14,000 RSV tests, which is a considerably larger study sample than that reported by other investigators.¹⁷ RSV activity was monitored from five regions within the state over a period of three seasons and included cities with the largest populations within the state. Thus, we were able to determine trends in RSV activity within some regions and for the state over time. We acknowledge the following limitations, which could have biased study outcomes. Results of antigen testing were used to determine the presence of RSV in communities as only one site reported results of viral cultures; nevertheless, numerous state health departments and the NREVSS use similar testing methodology. The decision to test individual patients for RSV was left to the discretion of each clinician involved in the study, and data were reported by month rather than by week. As can be expected, the overwhelming majority of data

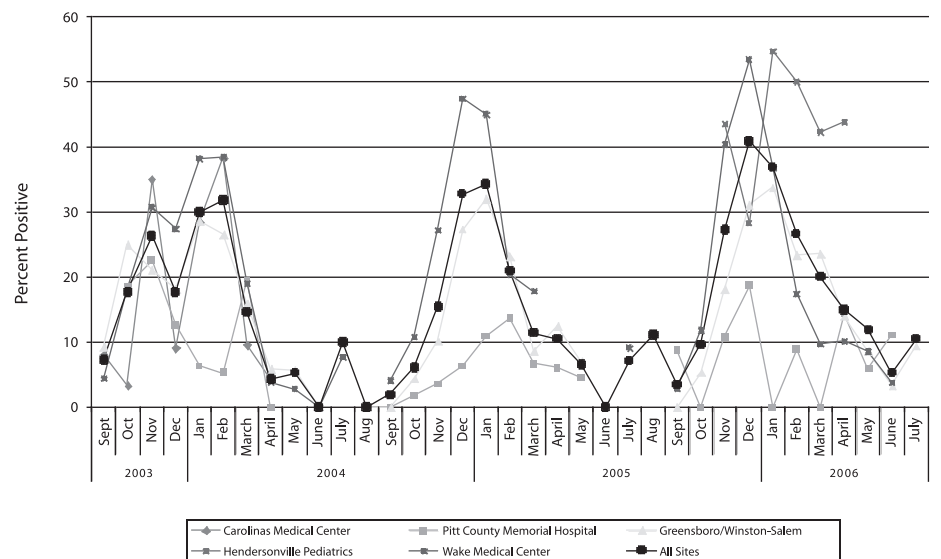
Figure 3.
RSV Test Data for Wake Medical Center for Years 2003-2006



came from large metropolitan areas. The imbalance of data from these centers could limit generalizations about statewide results.

Our data suggest that the RSV season in regions of North Carolina may be longer than the national average reported by the CDC. Additionally, RSV epidemics can persist during months that fall outside of those in which RSV prophylaxis is recommended by American Academy of Pediatrics for high-risk children. Guidelines on the administration of RSV prophylaxis should ideally be based on results of local RSV test data. **NCMJ**

Figure 4.
RSV Test Data From Each Study Site in North Carolina for Years 2003-2006



Financial Disclosure: MedImmune, Inc., provided funding for data management. None of the participating principal investigators received any monetary compensation.

Acknowledgment: The authors and North Carolina RSV Study Team acknowledge the efforts of Dr. Jay H. Bauman, Scientific and Technical Evaluation, of Pharmaceuticals, Inc., for his analysis and assistance with manuscript preparation.

North Carolina RSV Study Team

Member	Institution
Brent T. Baker, MD	Hendersonville Pediatrics
Joy Barwick, MT, (ASCP)	Pitt County Memorial Hospital
Danny Benjamin, MD, PhD	Duke University
Rosemary Billings	Wake Medical Center
Louise Hester	Wake Forest University Baptist Medical Center
Sue Knost, MS, (ASCP)	Carolina's Medical Center
Cassandra Moran, DO	Duke University
Elizabeth Palavecino, MD	Wake Forest University Baptist Medical Center
Mitzi Rumley	Spectrum Lab
David Wilfret, MD	Duke University

REFERENCES

- Shay DK, Holman RC, Newman RD, et al. Bronchiolitis-associated hospitalizations among US children, 1980-1986. *JAMA*. 1999;282:1440-1446.
- Leader S, Kohlhasse K. Recent trends in severe respiratory syncytial virus (RSV) among US infants, 1997 to 2000. *J Pediatr*. 2003;143:S127-S132.
- McLaurin K, Leader S. Growing impact of RSV hospitalizations among infants in the US, 1997-2002. Paper presented at: Pediatric Academic Societies Annual Meeting; May 2005; Washington, DC.
- Glezen WP, Taber LH, Frank AL, Kasel JA. Risk of primary infection and reinfection with respiratory syncytial virus. *Am J Dis Child*. 1986;140:543-546.
- American Academy of Pediatrics. Respiratory Syncytial Virus. In: Pickering KL, ed. *Redbook: 2006 Report of the Committee on Infectious Diseases*. 27th ed. Elk Grove Village: American Academy of Pediatrics; 2006:560-566.
- Sigurs N, Gustafsson PM, Bjarnason R, et al. Severe respiratory syncytial virus bronchiolitis in infancy and asthma and allergy at age 13. *Am J Respir Crit Care Med*. 2005;171:137-141.
- Thompson WW, Shay DK, Weintraub E, et al. Mortality associated with influenza and respiratory syncytial virus in the United States. *JAMA*. 2003;289:179-186.
- Feltes TF, Cabalka AK, Meissner C, et al. Palivizumab prophylaxis reduces hospitalization due to respiratory syncytial virus in young children with hemodynamically significant heart disease. *J Pediatr*. 2003;143:532-540.
- Connor EM, Impact-RSV Study Group. Palivizumab, a humanized respiratory syncytial virus monoclonal antibody, reduces hospitalization from respiratory syncytial virus infection in high-risk infants. *Pediatrics*. 1998;102:531-537.
- Mullins JA, Lamonte AC, Bresee JS, Anderson LJ. Substantial variability in community respiratory syncytial virus season timing. *Pediatr Infect Dis J*. 2003;22:857-862.
- Centers for Disease Control and Prevention. Brief report: respiratory syncytial virus activity—United States, 2005-2006. *MMWR Morb Mortal Wkly Rep*. 2006;55:1277-1279.
- Bauman J, Eggleston M, Oquist N, Malinoski F. Respiratory syncytial virus: seasonal data for regions of Florida and implications for palivizumab. *South Med*. 2007;100:669-676.
- Eggleston M, Bauman J. Regional respiratory syncytial virus surveillance data for Georgia and implications for prophylactic administration of palivizumab. Paper presented at: American Academy of Pediatrics National Conference and Exhibition; October 2007; San Francisco, CA.
- Fergie J, Purcell K. Respiratory syncytial virus laboratory surveillance and hospitalization. *Pediatr Infect Dis J*. 2007;26(suppl):S51-S54.
- Singleton RJ, Bruden D, Bulkow LR, Varney G, Butler JC. Decline in respiratory syncytial virus hospitalizations in a region with high hospitalization rates and prolonged season. *Pediatr Infect Dis J*. 2006;25:1116-1122.
- Ellis SE, Coffey CS, Mitchel EF, Dittus RS, Griffin MR. Influenza—and respiratory syncytial virus—associated morbidity and mortality in the nursing home population. *J Am Geriatr Soc*. 2003;51:761-767.
- Halstead DC, Jenkins SG. Continuous non-seasonal epidemic of respiratory syncytial virus infection in the southeast United States. *South Med J*. 1998;91:433-436.
- Reese PE, Marchette NJ. Respiratory syncytial virus infection and prevalence of subgroups A and B in Hawaii. *J Clin Microbiol*. 1991;29:2614-2615.
- Consensus Committee. Guidelines for prophylaxis for RSV infections in high-risk infants in Hawaii. Hawaii Academy of American Pediatric Organization website. <http://www.hawaiiap.org/pdfs/ConsensusStatement31AUG2007.pdf>. Accessed August 31, 2007.

North Carolina
2008
Child Health Report Card
2008



WITH FINANCIAL SUPPORT FROM:

Annie E. Casey Foundation

North Carolina Department of Health and Human Services



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 14th 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 2007) with a comparative year (usually 2002) as a benchmark. Unless otherwise noted, data are presented for calendar years. 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. To facilitate review, the indicators have been grouped into three broad categories — Access to Care and Preventive Health, Health Risk Behaviors, and Death and Injury. However, it should be recognized that virtually all of the indicators are interrelated.

“Don’t worry that children never listen to you; worry that they are always watching you.”
— Robert Fulghum

There are 2.2 million children (age 0-17) in North Carolina, more than ever before. Approximately 20 percent continue to live in poverty. This represents a growing challenge to adults — in the home, in the community, and collectively through government — who are responsible for protecting children from harm and providing opportunities for healthy growth. The data in this *Report Card* serve as indicators of how North Carolina is collectively discharging these responsibilities.

The data provide reason for celebration, tempered by both caution and concern. For the majority of the indicators, the trend is toward improvement, and for several — the immunization rate; the lead poisoning rate; the number of children with access to early intervention services — the data are truly encouraging. For other indicators — the uninsured rate; infant and child death rates; the breastfeeding initiation rate — the data indicate possible stagnation, and this warrants caution. Finally, the data for some indicators — child abuse homicide; access to dental care; overweight children; the use of alcohol, tobacco and illegal substances — reflect unacceptable risks to children and youth, and should be cause for grave concern. When data are available, they indicate that racial disparities remain disturbingly wide.

While North Carolina still has a long way to go, it is heartening that all of the indicators in the *Report Card* are being addressed. Through new safety statutes, additional legislative appropriations, and innovative programs introduced by state and local agencies, North Carolina continues to invest in its children.

Action for Children North Carolina and the North Carolina Institute of Medicine are pleased to support this effort through the production of study reports and participation in evidence-based decision-making. The North Carolina Institute of Medicine has sponsored task force studies on access to care, adolescent health, prevention and many others.

Children are 20 percent of our population, but they are 100 percent of our future. They will soon be our leaders, our producers and our consumers. Now is the time for adults — both collectively and individually — to make the investments that will assure a bright future for our state.

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 percent between the given data points. A percentage change of 5 percent or less between the two years of data is described as “No Change.” Percent change and trends have not been given for population count data. 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.

Tom Vitaglione, Alexandra Forter Sirota and Angella Bellota from Action for Children North Carolina and Mark Holmes, Berkeley Yorkery, Jennifer Hastings and David Jones from the North Carolina Institute of Medicine led the development of this publication, with valuable contributions from many staff members of the North Carolina Department of Health and Human Services.

This project was supported by the Annie E. Casey Foundation’s KIDS COUNT project, the North Carolina Department of Health and Human Services, the Blue Cross and Blue Shield of North Carolina Foundation and Novo Nordisk. Action for Children and the North Carolina Institute of Medicine thank them for their support but acknowledge that the findings and conclusions do not necessarily reflect the opinions of financial supporters.

Access to Care and Preventive Health

Access to preventive and primary care is critical to assuring the health of our children. The data indicate that enrollment in public insurance programs has grown dramatically and that enrolled children are receiving preventive care. However, it is alarming to note that the uninsured rate for children increased by 12.9 percent between 2002 and 2007, largely because North Carolina has experienced one of the largest decreases of employer-based coverage in the nation. The North Carolina General Assembly has approved an expansion of children's health insurance, called N.C. Kids' Care, but this program cannot be implemented without an increase in federal matching funds, which the current federal administration has not made available. Providing more children with health insurance coverage will serve to further improve the health outcomes of children and, in turn, the health of their communities.

North Carolina's investments in prevention and early intervention have been exemplary. Public insurance enrollment is high, immunization rates are encouraging, the early intervention system for young children with special needs has received national acclaim, exposure to lead continues to diminish and serious chronic illnesses such as asthma are being identified earlier and managed more successfully. Access to dental care has improved somewhat but continues to be a major problem that warrants serious attention.

Health Indicator	Current Year	Benchmark Year	% Change	Grade	Trend
Insurance Coverage	2007	2002			
% of all children (age 0-17) uninsured	13.1%	11.6%	12.9%	D	Worse
Number of children (age 0-18) covered by public health insurance (Medicaid or Health Choice)	889,642	664,734	33.8%	B	Better
% of Medicaid-enrolled children (age 0-18) receiving preventive care	76.9%	72.5%	6.1%	B	Better
Breastfeeding¹	2005	2000			
% ever breastfed	66.2%	66.5%	-0.5%	C	No change
% breastfed at six months	37.5%	29.3%	28.0%	C	Better
Immunization Rates²	2007	2002			
% of children with appropriate immunizations:					
At age 2	77.3%	69.7%	10.9%	A	Better
At school entry	96.7%	99.4%	-2.7%	A	No Change
Early Intervention	2007	2002			
Number of children (age 0-3) enrolled in early intervention services to reduce effects of developmental delay, emotional disturbance and/or chronic illness	15,048	10,264	46.6%	B	Better
Environmental Health	2007	2002			
Lead ³ : % of children (age 12-36 months):					
Screened for elevated blood lead levels	44.9%	36.2%	24.0%	C	Better
Found to have elevated blood lead levels	0.6%	1.9%	-68.4%	B	Better
Asthma ⁴ :					
% of children diagnosed	15.7%	-	n/a	D	n/a
Hospital discharges per 100,000 children (age 0-14)	2006 152.8	2001 203.0	-24.7%	B	Better
Dental Health	2007	2002			
% of children:					
With untreated tooth decay (kindergarten)	19.0%	24.0%	-20.8%	D	Better
With one or more sealants (grade 5)	42.0%	37.0%	13.5%	C	Better
% of Medicaid-eligible children:					
Age 1-5 who use dental services	42.6%	16.6%	156.6%	C	Better
Age 6-14 who use dental services	49.3%	37.2%	32.5%	C	Better
Age 15-20 who use dental services	34.3%	25.5%	34.5%	D	Better

Health Risk Behaviors

Children's health behaviors and risk-taking (sexual activity, poor nutrition, physical inactivity, substance use, violence, etc.) are determined by a variety of factors. Governments, foundations, communities, schools, and adults all play important roles in supporting healthy behaviors among children. Implementing evidence-based programs and policies increases the impact of financial and resource investments and can improve child health outcomes.

Since 2002, there have been some improvements worth noting. The national decline in teen pregnancy rates (for girls age 15-17) continues to be experienced in North Carolina, although the wide racial disparity in the rates is of particular concern. The continued drop in congenital syphilis and the near elimination of perinatal transmission of HIV/AIDS are true public health success stories.

While there have been successes, there are also some areas of serious concern. In particular, the high percentages of overweight children and tobacco, alcohol and substance use among adolescents are troubling. Due to investments in evidence-based programs and policies as well as media outreach led by the N.C. Department of Health and Human Services and the N.C. Health and Wellness Trust Fund, the state has seen large declines in youth tobacco use. The lessons learned from these efforts are helping to shape similar multi-faceted interventions to address the issue of overweight children in North Carolina.

Health Indicator	Current Year	Benchmark Year	% Change	Grade	Trend
Teen Pregnancy	2007	2002			
Number of pregnancies per 1,000 girls (age 15-17):					
All	34.8	38.3	-9.1%	C	Better
White	27.7	30.8	-10.1%	C	Better
All Other Races	47.3	54.2	-12.7%	D	Better
Communicable Diseases	2007	2002			
Number of newly-reported cases:					
Congenital Syphilis at birth	7	16	-	B	-
Perinatal HIV/AIDS at birth	1	3	-	A	-
Tuberculosis (age 0-19)	41	42	-	C	-
Overweight⁵	2007	2002			
% of low-income children who are overweight:					
Age 2-4	15.3%	13.5%	13.3%	D	Worse
Age 5-11	24.9%	21.1%	18.0%	F	Worse
Age 12-18	29.9%	26.3%	13.7%	F	Worse
Physical Activity	2007	2005			
% 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%	n/a	D	n/a
Alcohol, Tobacco & Substance Abuse	2007	2003			
% of students (grades 9-12) who used the following in the past 30 days:					
Cigarettes	19.0%	27.3%	-30.4%	D	Better
Smokeless Tobacco	8.6%	9.5%	-9.5%	C	Better
Marijuana	19.1%	24.3%	-21.4%	D	Better
Alcohol (including beer)	37.7%	39.4%	-4.3%	F	No Change
Cocaine (lifetime)	7.0%	8.4%	-16.7%	F	No Change
Methamphetamines (lifetime)	4.7%	6.6%	-28.8%	D	No Change

Death and Injury

After dropping in 2006 to the lowest rate ever recorded in North Carolina, the infant death rate increased slightly in 2007. While this important indicator has dropped by a remarkable 25 percent in the past two decades, the rate has been relatively stagnant in recent years, and North Carolina still ranks poorly among all states. The N.C. Department of Health and Human Services, the N.C. Child Fatality Task Force, the March of Dimes, and other agencies are jointly providing increased attention to prematurity and low birthweight, which have been serious, relatively intractable components of infant mortality. The persistently wide racial disparity is cause for grave concern, meriting increased attention.

Similarly, the overall child death rate rose slightly in 2007 after dropping to its lowest level in 2006. This rate has dropped by almost 30 percent in the past two decades, helped largely by the passage of numerous child safety laws during this period. Injuries are the leading cause of death in children. The N.C. Child Fatality Task Force, as well as state and local review teams, continues to explore ways to prevent child deaths. Increases in homicides and firearm-related deaths command increased attention.

In an attempt to deal with child abuse and neglect more effectively, all 100 counties now participate in the Multiple Response System. Since this has changed many data definitions, trend data on assessments and substantiations are not available. However, the recurrence of maltreatment continues to decline, which is encouraging. Child abuse homicide is perhaps the most tragic of all indicators. In 2007, 25 children who were murdered died at the hands of a parent or caregiver.

Health Indicator	Current Year	Benchmark Year	% Change	Grade	Trend
Infant Mortality	2007	2002			
Number of infant deaths per 1,000 live births:					
All	8.5	8.2	3.7%	B	No Change
White	6.3	5.9	6.8%	B	Worse
All Other Races	13.9	14.2	-2.1%	D	No Change
Low Birthweight Infants	2007	2002			
% of infants born weighing 5 lbs., 8 ozs. (2,500 grams) or less:					
All	9.2%	8.9%	3.4%	D	No Change
White	7.5%	7.4%	1.4%	D	No Change
All Other Races	13.8%	13.3%	3.8%	F	No Change
Child Fatality	2007	2002			
Number of deaths (age 0-17) per 100,000					
	75.1	73.8	1.8%	B	No Change
Deaths Due to Injury	2007	2002			
Number of deaths (age 0-17):					
Motor vehicle-related	142	174	-	C	-
Drowning	26	23	-	C	-
Fire/Burn	24	23	-	C	-
Bicycle	4	5	-	B	-
Suicide	26	19	-	D	-
Homicide	61	43	-	F	-
Firearm	52	32	-	F	-
Child Abuse and Neglect (Including Deaths)	2007	2002			
Number of children:					
Receiving assessments for abuse and neglect	121,521	-	n/a	-	n/a
Substantiated as victims of abuse and neglect	14,475	-	n/a	-	n/a
Found in need of services	13,193	-	n/a	-	n/a
% of children experiencing recurrence of maltreatment within six months	4.09%	7.95%	-49%	B	Better
Confirmed child deaths due to abuse	25	26	-	F	-

Data Sources

Access to Care and Preventive Health

Uninsured: 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, N.C. Department of Health and Human Services, August 2008; *Medicaid-Enrolled Preventive Care*: Calculated using data from the Division of Medical Assistance, N.C. DHHS, "Health Check Participation Data." Available online at: <http://www.dhhs.state.nc.us/dma/healthcheck.htm>; *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: <http://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, N.C. DHHS, August 2008; *Lead*: Special data request to the Childhood Lead Poisoning Prevention Program, N.C. Department of Environment and Natural Resources, August 2008; *Asthma Diagnosed*: State Center for Health Statistics, N.C. DHHS Child Health Assessment and Monitoring Program. Available online at: <http://www.schs.state.nc.us/SCHS/champ/2007/topics.html>; *Asthma Hospitalizations*: State Center for Health Statistics, N.C. 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, N.C. DHHS, August 2008.

Health Risk Behaviors

Teen Pregnancy: State Center for Health Statistics, N.C. 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 and Epidemiology Section, Division of Public Health, N.C. DHHS, August 2008; *Overweight*: 2007 NC-NPASS Data. "Proportion of Overweight (BMI \geq 95th Percentile) Children by Age, Race and Gender, NC-NPASS* 2007." Available online at: <http://www.eatsmartmovemorenc.com/data/index.html>; *Tobacco Use*: N.C. Tobacco Prevention and Control Branch, N.C. DHHS, N.C. 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, N.C. DHHS, "North Carolina Infant Mortality Report." Available online at: <http://www.schs.state.nc.us/SCHS/deaths/ims/2007/>; *Low Birth-Weight Infants*: State Center for Health Statistics, N.C. 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/deaths/ims/2007/>; *Child Fatality and Deaths Due to Injury*: Women's and Children's Health Section, Division of Public Health, N.C. 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*: Special data request to the Division of Social Services, N.C. DHHS, October 2008; *Recurrence of Maltreatment*: Duncan, D.F., Kum, H.C., Flair, K.A., Stewart, C.J., Weigensberg, E.C. (2008). N.C. Child Welfare Program. Retrieved 8/4/08, from University of North Carolina at Chapel Hill Jordan Institute for Families website. Available online at: <http://ssw.unc.edu/cwl/>; *Child Abuse Homicide*: information was obtained from the N.C. Child Fatality Prevention Team (Office of the Chief Medical Examiner) for this report. However, the analysis, conclusions, opinions and statements expressed by the author and the agency that funded this report are not necessarily those of the CFPT or OCME.

Data Notes

- Breastfeeding** has been introduced as an indicator because evidence is growing that breastfeeding decreases the incidence and severity of childhood infectious diseases and is also associated with decreases in the occurrence of Sudden Infant Death Syndrome (SIDS). The N.C. Department of Health and Human Services has adopted a Blueprint for Action to promote breastfeeding statewide. The Department is collaborating with the N.C. Child Fatality Task Force and the Carolina Breastfeeding Institute to improve this indicator.
- Immunization** measured for 2-year-olds is the 4:3:1:3:3:1 series, the current CDC immunization recommendation, which includes four or more doses of DtaP/DTP/DTd, three or more doses of polio virus vaccine, one or more doses of any measles-mumps-rubella vaccine, three or more doses of Haemophilus influenzae type b (Hib) vaccine, three or more doses of hepatitis B vaccine, and one or more doses of varicella. In previous years of this *Report Card*, the 2-year-old immunization series measured a different immunization series. The Kindergarten data measure the percentage of children meeting the N.C. School Immunization Requirements. More information on the immunization requirements is available online at: <http://immunizenc.com/parentschoolreqs.htm>.
- Elevated Blood Lead Level** is defined as 10 micrograms per deciliter or greater. The 2007 percentage of 0.6 percent is the lowest ever reported in North Carolina, largely due to awareness campaigns and the continued reduction in exposure to products containing lead, and lead paint in particular.
- Asthma** remains the leading chronic illness among our children and is also one of the leading health reasons for school absence. The continued, dramatic decline in the hospital discharge rate reflects the success of the Community Care of North Carolina initiative in educating primary care providers and families in the management of the illness.
- Overweight** is conservatively defined as a body mass index equal to or greater than the 95th percentile using federal guidelines. 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. These data send an important signal that must be heeded.

Action for Children North Carolina

1300 Saint Mary's St., Suite 500
Raleigh, NC 27605-1276
PHONE 919.834.6623 x 202
FAX 919.829.7299
E-MAIL admin@ncchild.org
WEBSITE www.ncchild.org

North Carolina Institute of Medicine

630 Davis Dr., Suite 100
Morrisville, NC 27560
PHONE 919.401.6599
FAX 919.401.6899
WEBSITE www.nciom.org

POLICY FORUM

School Health Policy in North Carolina

Introduction

Thomas C. Ricketts III, PhD, MPH; Christine Nielsen, MPH

Issue Brief: School Health Policy in North Carolina

*Paula Hudson Collins, MHD, RHEd;
Howard N. Lee, MSW*

COMMENTARIES

North Carolina's Standard Course of Study in Healthful Living Education

Donna Breitenstein, EdD

Sidebar: Teaching Health

Linda Harrill Rudisill

What's for Lunch in North Carolina's Public Schools—Healthy Foods or Healthy Finances?

Lynn Hoggard, EdD, RD, LDN, FADA

Accountability Means Quality Physical Activity

Ernest Holcomb

Sidebar: Implementing North Carolina's Healthy Active Children Policy

Heather D. Pope

Sidebar: Programs Addressing Health in North Carolina's Schools

David K. Jones

School Nurses, Counselors, and Child and Family Support Teams

Tony Troop; Carol P. Tyson, RN, MPH

The Role of the Primary Care Physician in School Health: The Wayne County Experience

Dave Tayloe Jr., MD, FAAP

School-Based Dental Disease Prevention and Oral Health Education: Programs of the North Carolina Oral Health Section

Rebecca S. King, DDS, MPH; R. Gary Rozier, DDS, MPH

The Case for a Comprehensive, Effective, and Realistic Anti-Bullying Policy in North Carolina's Schools

Representative Rick Glazier, JD

Understanding the Role of Special Education in North Carolina's Public Schools

Mary N. Watson

Immunizations and the Role of North Carolina Schools

Beth Rowe-West, RN; Amy Caruso

School-Based Substance Abuse Prevention: A Public Health Perspective

Anne Thomas, MPA; Sheila Davies

Teen Pregnancy in North Carolina

Kay Phillips

“In North Carolina...health issues in schools are reaching an acute level and demanding the focus of local education agencies as well as employers, colleges, universities, and other institutions.”

INTRODUCTION

Policy Forum: *School Health Policy in North Carolina*

There is currently a vigorous debate over what constitutes the “determinants” of health and how to change them to improve health outcomes. We have long understood that medical care is not the primary determinant of longevity and health status. Our genetic make up, our nutrition, and the quality of our physical environment have as much or more influence on how healthy we are and will be. But another component is how we behave and how we learn to take care of ourselves. These determinants are influenced by our family upbringing but also by our formal schooling.

Our experience in school, from the very beginning in kindergarten through high school and beyond, often shapes our health habits and how we view and understand healthy behaviors. What children eat at school, for example, is an important determinant of lifelong nutrition habits. The importance of this and many other determinants is echoed in the articles that appear in this issue of the *North Carolina Medical Journal*. North Carolina’s public schools recognize the link between health and school performance and have crafted programs and services that can help children maximize their health as well as their academic potential. However, this is not done without some controversy and difficulties. The realm of health behavior education often includes social and personal behavior that is politically delicate. For example, our children mature sexually and physically during their school years and these transitions need to be supported by education and teaching. Where and how that teaching is done is, at times, difficult to determine.

The environment that surrounds students in school is also an important determinant of their performance and health. That environment includes the availability of exercise and physical education, the availability of healthy foods, and the exclusion of harmful substances and harmful influences. These environmental factors are discussed in multiple articles in this issue. While these determinants vary from school to school and from child to child, the ultimate goal for our state must be to work towards a healthy school environment for every student. Schools are an important setting for establishing lifelong learning and health behaviors and it is vital that we realize that, given the chance, students can thrive in healthy school environments.

We hope that this issue of the *Journal* will inspire those who work in and with our schools to consider all the different factors that make up a healthy school environment. Parents, teachers, and school administrators all have a role to play, as do local and state policymakers. From the classroom, to lunch line, to the playground, there are numerous ways that all of us can encourage greater health among school aged youth. Just like health maintenance, learning is truly a lifelong endeavor, and the union of the two present incredible opportunities.

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

Christine Nielsen, MPH
Managing Editor

School Health Policy in North Carolina

Paula Hudson Collins, MHDL, RHED; Howard N. Lee, MSW

On any given school day, you will find 93% of North Carolina's children in one of more than 2,400 North Carolina public schools and charter schools. These 1.4 million students are taught by 190,000 teachers and staff in one of 115 local education agencies (LEAs) governed by a local board of education. North Carolina students are transported to and from schools in 14,000 school buses and eat over 1.8 million school meals per day.¹

In North Carolina, as in the nation, health issues in schools are reaching an acute level and demanding the focus of local education agencies as well as employers, colleges, universities, and other institutions. Academic achievement is at the heart of the purpose of public schools, while health care and wellness activities are not core functions of K-12 public schools. But there are ways that schools can and must support student and teacher wellness.

Academic achievement is the focus of the school day as North Carolina students are being prepared with 21st century skills to compete in a global economy. The North Carolina State Board of Education (NCSBE) and the North Carolina Department of Public Instruction (NCDPI) work collaboratively and continuously to raise the educational standards and expectations for North Carolina students and teachers, ultimately leading to higher graduation rates.

In North Carolina schools, three markers—poverty, poor educational attainment, and poor health—can create obstacles to succeeding in school. We know that children who come from poor families with parents who have low education levels are more likely to suffer from poor health. And at the end of the day, these youngsters are also more likely to struggle with the academics of school.

In North Carolina, more than 15% of our residents live below the poverty rate; this percentage is higher for African American, Asian, and Latino groups. In some regions of our state—especially in the rural areas—

the poverty rate is as high as 26%. In terms of educational attainment, one-fifth of North Carolinians do not have a high school diploma, and only 23% have earned a bachelor's degree or higher.² That means many parents of public school children have a low educational attainment. While schools cannot directly address the poverty level of students and their families, schools can play a supportive role in improving the health of children and fostering their desire to learn.

The guiding mission of the North Carolina State Board of Education is that every public school student will graduate

“In North Carolina schools, three markers—poverty, poor educational attainment, and poor health—can create obstacles to succeeding in school.”

from high school, be globally competitive for work and postsecondary education, and be prepared for life in the 21st century. To accomplish this mission, the State Board of Education has five goals, one of which specifically focuses on the health of students (see Table 1).

The North Carolina State Board of Education has long recognized the positive link between a student's health status and academic gains in addition to the link between health

Table 1.
The Five Goals of the North Carolina State Board of Education

- NC public schools will produce globally competitive students
- NC public schools will be led by 21st century professionals
- **NC public school students will be healthy and responsible**
- Leadership will guide innovation in NC public schools
- NC public schools will be governed and supported by 21st century systems

Paula Hudson Collins, MHDL, RHED, is the senior policy advisor for Healthy Responsible Students at the North Carolina State Board of Education. She can be reached at pcollins@dpi.state.nc.us.

Howard N. Lee, MSW, is the chairman of the North Carolina State Board of Education.

behaviors in childhood and the development of chronic diseases and health problems later in life. Thus, the State Board of Education has implemented policies aimed at reducing and preventing obesity, diabetes, teen pregnancy, sexually transmitted diseases (STDs), and substance use and improving the mental health and well-being of North Carolina public school students. The State Board of Education also has recognized the unique challenges faced by students with special education needs. Mary N. Watson writes about these children and the role of special education in North Carolina's public schools in her commentary in this issue of the *Journal*. In addition, the NCSBE is the only state board in the nation to appoint a senior advisor for Healthy Responsible Student issues to monitor and advance health policies, programs, and legislative practices to benefit students.

In order for students in North Carolina's public schools to be successful, educators realize that educating the whole child is the key. Former US Senator William Cohen (Maine) perhaps said it best: "It is clear that children must be healthy to be educated and they must be educated to be healthy."³ While this might appear to be the old chicken or the egg quandary, educators must simultaneously address student health status as well as readiness to learn. A high-quality, coordinated school health program does just this by effectively addressing students' health issues and improving their ability to learn.

For 10 years, North Carolina has been fortunate to be one of 20 states in the nation to receive competitive funding from the Centers for Disease Control and Prevention (CDC) to promote Coordinated School Health Programs (CSHP) at the state and local levels. This funding made possible the development of the North Carolina Healthy Schools Initiative. Through this CDC model, the state education agency receives funding to establish CSHPs while working collaboratively with the state health department in order to evaluate health behavior change among school students and the school environment. The North Carolina Department of Public Instruction monitors student health and health behaviors through the Youth Risk Behavior Survey (YRBS) and the School Health Education Profiles Survey (see sidebar).

The North Carolina Department of Public Instruction receives funding from the CDC through a competitive cooperative agreement process for staffing and program activities. Four staff positions including a section chief; an HIV/AIDS consultant; a physical activity, nutrition, and tobacco consultant; and a unit administrative assistant are housed in NCDPI and focus on designing, implementing, and sustaining Coordinated School Health Programs. An abstinence education consultant, funded through separate federal funds, is joined by a health education and drivers' education consultant and a physical education, athletics, and sports medicine consultant to complete the North Carolina Healthy Schools Team at NCDPI. In addition, these CDC funds allow the North Carolina Healthy Schools Initiative to fund a senior advisor for the Healthy Schools Program—housed in the North Carolina Division of Public Health—who is the counterpart of the section chief for the Healthy Schools Section in NCDPI. This infrastructure

Health Data Collection

Data collection is important in helping to plan professional development and determine curriculum needs and updates. In the spring of odd numbered years, North Carolina Healthy Schools implements the statewide Youth Risk Behavior Survey (YRBS) in randomly-selected middle and high schools. The YRBS helps to assess youth health behaviors. Annual and trend data are located at www.nchealthyschools.org.

In even numbered years, the statewide School Health Education Profiles Survey is conducted. The Profiles Survey has two parts. The Principal survey assesses policies related to health education and school climate, and the Lead Health Educator survey looks at health programs and student skill development.

enhances the cooperative working relationship between education and health at both the state and local levels.

While state-level infrastructure for North Carolina Healthy Schools was being developed and implemented, the same collaboration was being encouraged at the local level through a variety of strategies. For example, North Carolina Healthy Schools designed the Leadership Assembly which brought together the LEA superintendent and the health department director from each county, providing this local partnership the time and technical assistance to jointly plan health projects for their communities. In 2005, North Carolina Healthy Schools received the prestigious Distinguished Health Education Program Award from the CDC and the Public Health Education and Promotion Network and was recognized as a national model for Coordinated School Health Programs. The NCDPI was recently awarded another five-year cycle of CSHP funding from the CDC totaling around one million dollars annually.

Complementing the North Carolina Healthy Schools Initiative is the North Carolina Comprehensive School Health Training Center (NCCSHTC) which has been located at Appalachian State University for 15 years. Its primary mission is professional development in health education for teachers, other school personnel (counselors, nurses, administrators), and community health educators. A cadre of 18 trainers with rich and diverse professional health backgrounds serves as a professional development model for other states as recognized by the CDC. The Training Center is funded primarily by the HIV Prevention Grant awarded to NCDPI. Over the years, additional North Carolina Healthy Schools funding and supplemental grant awards have enhanced the capacity of NCDPI by assisting with grant writing, presentations, needs assessments, survey reports, instructional materials, technical assistance, and evaluation. The Training Center's services are based on up-to-date content skills and strategies and are consistent with the North Carolina Standard Course of Study in Healthful Living Education and with state laws.

The Coordinated School Health Model promotes eight components of a healthy school with school professionals

working together to address health issues. The eight components of a Coordinated School Health Program (CSHP) include the following: comprehensive school health education; physical education; school nutrition services; school health services; a healthy school environment; school counseling, psychological and social services; school-site health promotion for staff; and family and community involvement (see Figure 1).

Comprehensive school health education focuses on the health information, strategies, and skills taught to students. This classroom-based instruction, provided as part of the Healthful Living Standard Course of Study, provides age-appropriate information about physical, mental, social, and emotional dimensions of health. It is designed to motivate and assist students to maintain and improve their health, prevent disease, and reduce health-related risk behaviors by helping the children develop health knowledge, attitudes, and skills (see Table 2). Health education promotes an understanding of the scientific basis for health status, the role of human behavior on health status, and the impact of public policy upon health status. Donna Breitenstein discusses the Standard Course of Study in Healthful Living Education in more detail on page 467.

Typically, North Carolina elementary students receive health instruction taught by their classroom teachers in lessons often integrated into other subjects. Time for health instruction competes with other equally important and tested subjects during the elementary students' day. The NCDPI has written the Balanced Curriculum Document to assist educators in pacing and balancing class time to allow the entire curriculum to be taught.

In middle school, grades six to eight, students receive health instruction from a licensed health education specialist and/or a licensed health and physical education teacher. Instruction in health education and physical education is blended into one curriculum known as Healthful Living Education. Students usually receive health education in a classroom setting while physical education is taught in a gymnasium, in another activity facility, or in outdoor and athletic spaces.

In high schools, students are required to pass one Healthful Living Education unit to graduate. This unit typically includes instruction equally divided to meet standards for both health and physical education. Over 95% of North Carolina's high school students complete the Healthful Living graduation requirement in the 9th grade.

Although the Healthful Living Curriculum focuses on a wide array of health-related topics, sexuality education has attracted a lot of attention over the years. The North Carolina General Assembly has directed the state to implement an abstinence until marriage curriculum, as required under NCGS §115C-81.¹² North Carolina's sexuality education focuses on abstinence until marriage as the only full-proof method of preventing teen pregnancy and eliminating the risk of HIV/STDs. Kay Phillips offers a commentary with a different perspective about the incidence of teen pregnancy in North Carolina and the nation,

Figure 1.
Coordinated School Health Model



Source: Marx E, Wooley S, Northrop, D. *Health is Academic: A Guide to Coordinated School Health Programs*. Reston, VA: National Association of Secondary School Principles; 1998.

its economic and social costs, and teen pregnancy prevention programs in North Carolina.

The North Carolina Healthful Living Standard Course of Study provides grade-level health objectives, but does not provide specific course curricula that must be taught each year. As mentioned previously, while health is its own discipline, health objectives are frequently integrated into other subjects. Examples of this integration include the following:

- Examining the nutritional composition of foods in a foreign culture through a social studies class
- Plotting a graph during math class of the number of steps recorded on a pedometer
- Reading a book about an unhealthy rabbit in language arts
- Discovering in a biology class the effects of a compromised immune system due to an HIV infection

Physical education is planned, sequential instruction that promotes lifelong physical activity. It is designed to develop basic motor skills, sports skills, and physical fitness as well as to enhance students' mental, physical, social, and emotional abilities.

Physical education is taught by a licensed physical education specialist and/or a health and physical education teacher. Physical education involves teaching students the skills, knowledge, and confidence they need to lead physically active lives. On the other hand, physical activity is actual bodily movement that may be practiced as part of a physical education curriculum. The CDC recommends children receive a minimum requirement of 60 minutes of moderate to vigorous activity each day for optimal health.¹³ In North Carolina, K-8 students receive 30

Table 2.
Health Risks for Adolescents that Result in Mortality, Morbidity, and Social Problems

Alcohol and Drug Use

Nationwide, alcohol use is a factor in approximately 40% of deaths from motor vehicle crashes.⁴ In North Carolina, 24.7% of high school students report they have ridden in a vehicle with someone who had been drinking alcohol, and 9.6% of high school students reported driving while under the influence. In 2007, 17% of high school students report that have taken prescription drugs one or more times during their life without a doctor's prescription. Marijuana use one or more times during their lifetime was reported by 36.4% of high school students and 11.9% of middle school students.⁵

Injury and Violence, Including Suicide

Injury and violence is the leading cause of death among youth ages 5 to 19, including motor vehicle crashes (35.7% of all deaths), all other unintentional injuries (12.1%), homicide (11.3%), and suicide (7.6%).⁶

Tobacco Use, Poor Nutrition, and Physical Activity

Tobacco use, a poor diet, and physical inactivity cause 7 in 10 preventable deaths in the state.⁷ In 2007, 16% of 6-17 year-olds were overweight, and 15.9% were obese.⁸ When it comes to tobacco use, 19% of high school students and 4.5% of middle school students smoke cigarettes.⁹

Sexual Behaviors

Adolescents 13-19 years of age represented 37% of all chlamydia cases and 26% of all gonorrhea cases in North Carolina in 2006.¹⁰ Also in 2006, over 19,000 teens ages 15-19 in North Carolina were pregnant. Nearly one-third of those pregnancies were repeat pregnancies. During that same year, 405 10-14 year-olds were pregnant.¹¹

These behaviors are usually established during childhood, persist into adulthood, and are interrelated. Many are preventable. In addition to causing serious health problems, these behaviors also contribute to the educational and social problems that confront the nation, including failure to complete high school, unemployment, and crime.

minutes of physical activity during the school day as required by the Healthy Active Children Policy (HSP-S-000). To meet this requirement, physical activity can be incorporated into other classroom activities. Creative teaching methods and materials such as “energizers,” which are classroom-based physical activities for elementary and middle schools are available at no charge to teachers and may be accessed at www.nchealthyschool.org.

In addition to the 30 minutes of physical activity, the Healthy Active Children Policy encourages but does not mandate that elementary schools offer 150 minutes of physical education weekly and that middle schools provide 225 minutes of Healthful Living Education every week. The policy further states that students may not be withheld from participating in recess as a form of punishment nor should they be required to do excessive physical activity as punishment. Significant research has been conducted about the merits and differences between physical activity and physical education, but researchers agree that active students make greater academic gains than inactive students. In his commentary, Ernest

Holcomb discusses how a number of LEAs have successfully implemented the Healthy Active Children Policy in their schools with resultant positive health outcomes. The Healthy Active Children Policy is available at www.ncpublicschools.org/State_Board.

In addition to comprehensive health education and physical education, the remaining six components of a Coordinated School Health Program are equally important to student success. These remaining components are school nutrition services; school health services; the healthy school environment; school counseling, psychological services, and social services; school-site health promotion for staff; and family and community involvement in schools.

School nutrition services focus on the integration of nutritious, affordable, and appealing meals; nutrition education; and the creation of an environment which promotes healthy eating behaviors for all children. The school meals program is designed to maximize each child's education and health potential. In her commentary, Lynn Hoggard discusses the role of schools in providing nutritious meals and food and beverage offerings. Good nutrition along with physical activity are essential to preventing chronic disease and obesity among North Carolina's youth, which is currently receiving a great deal of media attention. A peer-reviewed article in this issue of the *Journal* by Natalie Digate Muth and colleagues discusses the IMPACT program, a school-based pilot intervention for improving meals and physical activity in children and teens.

School health services include preventive services, education, emergency care, and referral and management of acute and chronic health conditions. These services are designed to identify and prevent health problems and injuries as well as to care for

students. Dave Tayloe describes his efforts in Wayne County to engage primary care physicians in school health by forming partnerships with primary care providers. In two additional commentaries, Rebecca S. King and R. Gary Rozier focus on school-based dental disease prevention and oral health education, while Beth Rowe-West and Amy Caruso explain state and federal immunization requirements and the successful school-based programs designed to immunize North Carolina's children.

The healthy school environment addresses the physical, emotional, and social climate of the school. It is designed to provide a safe physical facility, as well as a healthy and supportive environment that fosters learning. In his commentary, Representative Rick Glazier makes a case for the need for a more vigorous approach to stop bullying in North Carolina schools. In addition, given that tobacco use is the leading cause of preventable death in the state,¹³ North Carolina has successfully eliminated tobacco and second-hand smoke from the school environment. North Carolina Healthy Schools works with a variety of partners to combat this health threat and

promotes 100% tobacco-free school campuses at all times. Unfortunately, however, tobacco is not the only substance that North Carolina schools must confront. In their commentary, Anne Thomas and Sheila Davies describe Dare County's school-based substance abuse prevention program that aims to address the growing problem of drugs and alcohol among school-aged youth.

School counseling, psychological services, and social services include activities that focus on the cognitive, emotional, behavioral, and social needs of individuals, groups, and families. These services are designed to prevent and address problems, facilitate positive learning, and enhance health behavior development. In their commentary, Tony Troop and Carol P. Tyson write about the role of school nurses, counselors, and child and family support teams in North Carolina's schools and efforts to help youngsters and families access necessary health services.

School-site health promotion for staff includes assessment, education, and fitness activities for school faculty and staff. Its purpose is to maintain and improve the health and well-being of school faculty and staff who serve as role models for the students and their families.

Family and community involvement in schools creates partnerships among schools, families, community groups, and individuals. This involvement maximizes the resources and expertise available in addressing the healthy development of children, youth, and their families.

School Health Advisory Councils (SHACs) have been mandated at the LEA level as part of the Healthy Active Children Policy to assist the schools in organizing their action plans and implementing their work within the Coordinated School Health Program. These councils are minimally composed of representatives from each of the previously described eight components of the coordinated school health program plus a school administrator and a public health partner. Effective SHACs are the perfect vehicle for addressing a variety of health issues within the school setting. The councils provide a long-term advisory function for school decision makers.

North Carolina schools have taken important steps to improve the health and well-being of students, faculty, and staff through the implementation of the eight components of a

healthy school. However, more can and should be done. Imagine a school of the future focused on academics as well as the overall well-being of each student and staff member. In this school, students would have water bottles at their desks to help them stay hydrated throughout the day. The school cafeteria would only serve healthy a la carte foods and beverages and ample fresh fruits and vegetables. More students would select meals offered through the school meals program, which are required to meet the 1995 Dietary Guidelines for Americans and other federal requirements. Candy and unhealthy treats such as those that are high in fat and sugar would not be used as rewards for students, and teachers would model healthy eating. Physical fitness would be encouraged by allowing more students to participate in sports and physical activities through intramural activities, clubs, and special interest groups. Positive exercise habits would be modeled by teachers who take the opportunity to enjoy physical activity alongside their students during their daily recess or physical education classes. Physical education for students would focus on activities that are fun and engaging. The teachers' lounge would be stocked with healthy alternatives to the usual vending machine fare, and there would be on-site wellness programs to help teachers focus on their own health needs. Staff wellness programs would include activities to promote reaching and maintaining a healthy weight, stress management, and smoking cessation. The school facility would be connected to the community by sidewalks or bike pathways to enable more students to walk safely to school. The outdoor campus of the school would be pleasant and inviting. Gardens on the school grounds would provide seasonal flowers, wildlife habitat, and even fruits or vegetables for consumption. These gardens would be tended by students, parents, or faculty volunteers. This vision represents the ideal. Parts of this vision already exist in our schools; other parts remain dreams for the future. Together, NCDPI and our partners can help realize this vision in all of our schools.

By implementing the eight essential components of the Coordinated School Health Model, we are moving toward a vision where schools can partner with broader community efforts to improve the health status of our young people. **NCMJ**

REFERENCES

- 1 North Carolina Department of Public Instruction website. <http://ncdpi.com>. Accessed November 13, 2008.
- 2 US Census Bureau. Education: Adult Education. http://www.census.gov/compendia/statab/cats/education/adult_education.html. Accessed November 13, 2008.
- 3 Collins PH. Coordinating school efforts to help address the obesity epidemic in North Carolina. *NC Med J*. 2006;67(4):293-295.
- 4 Centers for Disease Control and Prevention. Healthy Youth! Alcohol and drug use. <http://www.cdc.gov/HealthyYouth/alcoholdrug/index.htm>. Accessed November 5, 2008.
- 5 North Carolina Department of Public Instruction and Department of Health and Human Services. NC Youth Risk Behavior Surveillance Survey, 2007. <http://www.nchealthyschools.org/data/yrbs/>. Accessed November 5, 2008.
- 6 North Carolina State Center for Health Statistics website. <http://www.schs.state.nc.us/SCHS/data/lcd/getleadcauses.cfm>. Accessed November 5, 2008.
- 7 NC Prevention Partners. *North Carolina Prevention Report Card 2008: A Progress Report on Prevention and Health in North Carolina 2005-2007*. Chapel Hill, NC: Prevention Partners; 2008

- 8 NC State Center for Health Statistics. NC Child Health Assessment Monitoring Program (CHAMP), 2007 data. <http://www.schs.state.nc.us/SCHS/champ/2007/wtc.html>. Accessed November 5, 2008.
- 9 NC State Center for Health Statistics. NC Youth Tobacco Survey, 2007 data. State High School Fact Sheet and State Middle School Fact Sheet. <http://www.tobaccoventionandcontrol.ncdhhs.gov/data/yts/index.htm>. Accessed November 5, 2008.
- 10 North Carolina Department of Public Instruction and Department of Health and Human Services. HIV/STD prevention. <http://www.nchealthyschools.org/hivstdprevention>. Accessed November 5, 2008.
- 11 North Carolina Department of Public Instruction and Department of Health and Human Services. Teen pregnancy prevention. <http://www.nchealthyschools.org/teenpregnancy>. Accessed November 5, 2008.
- 12 North Carolina General Statutes §115C-81
- 13 Centers for Disease Control and Prevention. State Tobacco Activities Tracking and Evaluation (STATE) System. <http://apps.nccd.cdc.gov/statesystem>. Accessed November 5, 2008.

How to Reach Us

LETTERS TO THE EDITOR

- Our email address is ncmedj@nciom.org
- Our fax number is 919.401.6899
- Or you can send your letter to: *North Carolina Medical Journal*, Letters, 630 Davis Drive, Suite 100, Morrisville, NC 27560
- Please include the author's full name, address, and daytime phone number. Letters may be edited for clarity or space.

SUBSCRIPTIONS AND GIFTS

- Customer services for subscriptions or gifts can be accessed via email ncmedj@nciom.org or by calling the *North Carolina Medical Journal's* business and advertising manager, Adrienne R. Parker, at 919.401.6599 ext. 28.

SUBMITTING PEER-REVIEWED ARTICLES

- For instructions on how to submit an article to the *North Carolina Medical Journal*, please visit <http://www.ncmedicaljournal.com/guideline.shtml>.
- Please send your articles via email ncmedj@nciom.org or mail to: *North Carolina Medical Journal*, Submissions, 630 Davis Drive, Suite 100, Morrisville, NC 27560.

CHANGE OF ADDRESS

- Please send your change of address via email to ncmedj@nciom.org or by calling the *North Carolina Medical Journal's* assistant managing editor, Phyllis Blackwell, at 919.401.6599 ext. 27.

REPRINTS AND PERMISSIONS

- Information is available on the website www.ncmedicaljournal.com/permissions.pdf.
- To request photocopy permission or content licensing, email ncmedj@nciom.org.

ADVERTISING

- For advertising information visit www.ncmedicaljournal.com/media.shtml or contact the *North Carolina Medical Journal's* assistant managing editor, Phyllis Blackwell, at phyllis_blackwell@nciom.org or 919.401.6599 ext. 27.

North Carolina
MEDICAL JOURNAL

North Carolina's Standard Course of Study in Healthful Living Education

Donna Breitenstein, EdD

Health education can save kids' lives. It is the subject area in the North Carolina Standard Course of Study (SCOS) which, if taught and taught well, can improve the quality and length of people's lives. However, despite its potential to enhance health and well-being, the teaching of health education is often shortchanged in North Carolina's schools.

A Skills-Based Approach to Prevention

The Standard Course of Study in Healthful Living Education includes health education and physical education, both of which are assigned five curriculum strands at each grade level, kindergarten through 8th grade. The health portion includes Mental and Emotional Health, Personal and Consumer Health, Interpersonal Communication and Relationships, Nutrition and Weight Management, and Substance Abuse Prevention. The SCOS is intended to prevent the serious health risks for adolescents identified by the Centers for Disease Control and Prevention and the North Carolina Department of Public Instruction (see Table 2, page 464).

The American Cancer Society has been a leader in creating and disseminating National Health Education Standards (NHES) to outline content knowledge (Standard 1) and skills (Standards 2 through 8) needed by youth to achieve health literacy. *Health literacy* is defined as "the capacity of an individual to obtain, interpret, and understand basic health information and services and the competence to use such information and services in ways which are health-enhancing."¹

North Carolina's SCOS is based on the prevention of serious health risks by youth and has adopted the NHES as the skills-based approach to prevention. The standards, listed in Table 1, are based on the belief that knowledge by itself does not change behavior. An example of the importance of skills acquisition is in tobacco prevention. Simple recall by students that tobacco is the leading preventable cause of death is insufficient for youth to avoid the use of all tobacco products. Medically accurate content should be taught along with the skills needed for influence analysis, decision making, goal setting, and effective refusal in order to sidestep negative peer pressure.

Course of Study Revision

The curriculum guide (competency goals and objectives at each grade level) is revised every five years. Consultants from the North Carolina Department of Public Instruction convene teachers and university faculty to review the Standard Course of Study and suggest revisions. In the subject area of health education, medical and public health professionals have been

"The Standard Course of Study in Healthful Living Education includes health education and physical education, both of which are assigned five curriculum strands at each grade level, kindergarten through 8th grade."

invited to advise public education in areas such as obesity, tobacco use, asthma, injury prevention, dental health, HIV prevention, and physical activity. Results from the North Carolina Youth Risk Behavior Survey (NC YRBS) are used to inform education professionals about the percentages of young people engaging in behaviors which can result in mortality, morbidity, and social problems. Results from the 2007 NC YRBS can be found at www.nchealthyschools.org.²

After these consultations, the proposed curriculum guide is posted for public comment. Additionally, legislative mandates from the North Carolina General Assembly must be accommodated. These North Carolina statutes include the teaching of alcohol and drug prevention, CPR and the

Donna Breitenstein, EdD, is a professor and coordinator of Health Education with Teacher Licensure at Appalachian State University and the director of the North Carolina Comprehensive School Health Training Center. She can be reached at breitenstein@appstate.edu.

Table 1.
National Health Education Standards
(NC Healthful Living Skills)

Students will be able to:

- Standard 1: Comprehend concepts related to health promotion and disease prevention
- Standard 2: Analyze the influence of factors on health behaviors
- Standard 3: Access valid information and products and services
- Standard 4: Use communication skills to enhance health and reduce risks
- Standard 5: Use decision-making skills to enhance health
- Standard 6: Use goal-setting skills to enhance health
- Standard 7: Practice health-enhancing behaviors
- Standard 8: Advocate for personal, family, and community health

Performance indicators for the Health Education Standards articulate what students should *know* or *be able to do* at grades 2, 5, 8, and 12 and can be found at <http://www.cdc.gov/HealthyYouth/SHER/standards/1.htm>.

Heimlich maneuver, and sexual abstinence until marriage. Finally, the State Board of Education suggests revisions and then grants approval of the Standard Course of Study.

Perceived Weaknesses and Barriers to Effective Health Education

In 1977, a document titled *Health Education: An Incomplete Commitment* was published by the North Carolina Center for Public Policy Research. The document cited four key reasons why health was not taught or taught well in many North Carolina Schools (see Table 2).³ Table 2 also lists current areas of improvement and continued weaknesses.

The lack of a comprehensive curriculum is no longer the reason health education has not measured up to its potential. The SCOS has been in place and is revised every five years to meet the needs of teachers, schools, and learners. The problems are attributable to hiring practices in local schools as well as a lack of accountability. Failure to employ appropriately credentialed teachers of health subjects is the result of a variety of factors, including a perception of health as a less important subject, emphasis on tested subjects such as math and language arts, hiring of coaches before teachers, lack of coursework in teacher preparation programs, controversy over and self-censorship of sexuality education (topics such as HIV, STD, and teen pregnancy prevention), and the assumption that physical education teachers are qualified to teach health education.

The NC School Health Education Profiles Study is conducted every two years (alternating with the NC Youth Risk Behavior Survey). Principals and lead health teachers at the middle and high school levels are asked to respond to a survey about the delivery of health education, coordinated school health programs,

Teaching Health

Linda Harrill Rudisill

"Children today have a shorter life expectancy than their parents for the first time in 100 years." - Dr. William Kish, Professor of Pediatrics, Baylor College of Medicine

The shorter life expectancy of children is of deep concern to parents, teachers, and medical professionals and begs the question, "What are schools doing in the area of prevention education?" The discipline of health education has the potential to have a dramatic effect on students, families, communities, and society as a whole, and yet it is too often given a cursory nod in North Carolina's public schools. As a health educator for 41 years in junior high schools and then middle schools, I have witnessed the indisputable difference health education can have on young people. Furthermore, students recognize and appreciate this meaningful and engaging area of study. Their comments speak volumes:

"Maybe one day health could be a core class."

"Every health class should have a real **health-educated** teacher."

"I think health class is just as important as math and language arts, because if you are not healthy, you will never succeed."

"I think health class is more important than any other class."

I have witnessed firsthand countless behavior changes my health-educated students have made—from finding packs of cigarettes and smokeless tobacco on my desk with anonymous notes attached stating "I QUIT" to confidential talks about the crises of the teen experience: sexual behaviors (e.g. pregnancy, STDs), eating disorders, bullies, weight issues, and family conflicts. Some examples of students' affirmations of the power of health education include:

"Since this class started, I have started to eat better, act better, and exercise more."

"I just wanted you to know health has really changed my life."

"I really do appreciate you being my health teacher. I was going to have my tongue pierced, but now I am not."

"I go home and teach my parents what we learn in class every day so they will become more health educated."

"You helped my mom quit smoking. I see my daddy on weekends and have convinced him to quit too."

Table 2.
Health Education from 1977-2008: Areas of Improvement and Areas of Continued Weakness¹

Weakness in 1977	Status in 2008
Health education in areas without coordinators is likely to continue to be inconsistent and fragmented.	In the 1970s, North Carolina was well on its way to supporting a state-funded school health coordinator in each local education agency (LEA) with support from the NC Medical Society. The initiative was derailed by the movement toward local control and the demise of categorical funding. Funding for positions intended for health education was “folded” into general budgets. Many LEAs assigned additional duties to the school health coordinator or assigned the responsibilities to someone not trained in health education. Only a few school systems currently have a full-time health education consultant.
Health education may still be perceived as a sibling of physical education and not as being important in its own right.	In some school systems, appropriately credentialed health educators are employed to teach most of the health education at the middle and high school levels. Cabarrus County and Iredell-Statesville are two which seek applicants with a degree in health education as well as licensure. In most systems it has been assumed that a graduate of a physical education degree program is able to teach health education. The State Board of Education has approved proposed dual licensure along with the requirement of 30 hours of professional development for those assigned to teach health without the appropriate degree and licensure. This arrangement will exist until 2012, at which time schools must hire a person to teach only health, only physical education, or hold a dual license to teach both subject areas.
There is no statewide comprehensive curriculum guide for the subject.	This weakness was rectified fairly quickly. Since 1990, the State Board of Education has approved a curriculum guide for health education and physical education. The North Carolina Standard Course of Study in Healthful Living Education is revised by NCDPI with input from educators and the public and is approved by the State Board every five years. There are instructional materials developed by the professional organization, the North Carolina Association for the Advancement of Health Education: <i>Successfully Teaching High School Health</i> , <i>Successfully Teaching Middle School Health</i> , and <i>Health Education: An Integrated Approach</i> .
There is no evaluation program to determine health education’s effectiveness.	This identified weakness is still true and is likely to continue. In many LEAs, there may be little accountability to oversee that health education is taught. There is little support from school administrators for any additional subject (besides math, language arts/English, and science) to become end-of-grade or end-of-course tested. With support from federal grants, there has been some backing for authentic assessment to evaluate skills instead of simply giving paper and pencil tests. Some teachers have sought professional development in assessing health literacy to learn strategies for authentic assessment.

and health policy. Findings in the 2006 survey include these references to the offering of health and the assignment of its teaching to teachers not licensed in the subject area:

While almost all principals report health being taught in middle schools and high schools (93% and 98% respectively), only 80% of lead health teachers in North Carolina middle schools and high schools report requiring health (a drop of 6% since 2004). Health education is reported as being taught as a combined course with physical education in 96% of high schools and 92% of middle schools. Only 72% of middle schools and 90% of high schools require newly hired health teachers to be licensed or endorsed by the state of North Carolina in health education.⁴

Additional barriers recognized by the North Carolina Association for the Advancement of Health Education (NCAAHE) include:⁵

- Teaching of health is currently not required after 9th grade
- The perception of some school administrators that health is a “minor” subject
- Combined scheduling and grading of health with physical education
- Shortage of classrooms
- Perception of physical education as “play” and health as “punishment”
- Accommodation of recommended minutes for physical activity (time taken from health education in some schools)

Efforts to Improve Health Education

There are school systems that have worked to overcome barriers and meet the needs of students for quality health education. Cabarrus County and Iredell-Statesville Schools have employed appropriately credentialed teachers of health, while Moore, Cumberland, and Surry counties require multiple and intensive professional development of their teachers of health. Many other systems support regular in-service training.

The support of federal grants from the CDC's Division of Adolescent and School Health has made a difference in the administrative support for health education, the quality of instructional materials, and the availability of professional development for teachers. Grants for HIV prevention and the Coordinated School Health Programs have resulted in the establishment of North Carolina Healthy Schools within the North Carolina Department of Public Instruction and in a position in the North Carolina Department of Health and Human Services.

The collaboration between public education and public health has been a "win-win" for promoting the health of school-aged children and youth. On the local level, many public health departments, medical facilities, and voluntary health agencies support health education through health fairs, guest speakers, and provision of materials.

Proposed Solution: Dual Licensure

Recognizing the lack of credentials of many teachers of health, the North Carolina State Board of Education (SBE) has recently established a policy regarding the qualifications of teachers of health education and physical education. In October of 2008, the SBE passed a policy to offer dual licensure by the year 2012. Colleges and universities will be able to continue separate degrees and also offer a dual degree to meet the standards and competencies of both disciplines. Until 2012, currently licensed teachers in physical education will be required to earn 30 hours (three Continuing Education Units) to earn a license in health education. Questions about accreditation and monitoring of the quality of dual programs will need to be addressed.

Proposed Solution: Professional Development

One way to enhance the quality of health education is to provide professional development for teachers who lack such a background. Even appropriately credentialed teachers need regular professional development, as health is a dynamic and ever-changing subject. In-service training is the mission of the North Carolina School Health Training Center, funded by the North Carolina Department of Public Instruction grants which originate with the Centers for Disease Control and Prevention. Approximately 45 six-hour workshops are offered each year in HIV/STD/teen pregnancy prevention, violence prevention and anti-bullying, tobacco prevention, and comprehensive health education through the Successfully Teaching Health manuals. The North Carolina Family Life Institute is a graduate-level

When we examine the lifestyle costs of chronic disease, we know health education must address these issues. Students want a caring adult who will listen to and hear what they are saying. Their heart-wrenching stories are drawn from past and present experiences in a sometimes unfair and uncaring world.

Health education is the students' lifeline for becoming health literate as they encounter pressures from peers, the media, scholastic expectations, and family obligations. Armed with knowledge, statistics, and skills, we can empower students to choose healthy behaviors.

Our mission is clear and demands dedicated attention. It is imperative that we invest the best from every dimension: highly trained and competent teachers, financial resources, instructional materials such as the *Successfully Teaching* manuals, and scheduling that commits to the critical subject area of health education. Educated decision-making skills reduce the chances of student involvement in self-defeating behaviors that can lead to life-scarring consequences.

Schools that fail to teach health with appropriate concern for children and youth are failing them in the most vital area of their educational journey.

Linda Harrill Rudisill taught health education for 41 years in Gaston County Schools and continues to advocate for quality health education. She can be reached at lharridken@aol.com.

intensive two-week workshop to prepare educators to be comfortable and confident to teach family life and sexuality education. The professional organization North Carolina Association for the Advancement of Health Education, within the North Carolina Alliance for Athletics, Health, Physical Education, and Dance, offers a statewide convention and other opportunities for professional development. East Carolina offers a master's degree in health education for teachers of other subject areas.

Proposed Solution: Evidence-Based and Promising Curricula

There are evidence-based curricula in certain curriculum strands, including HIV prevention, violence prevention, and tobacco use prevention. These curricula show significant differences in risk reduction by students receiving the instruction as compared with students in a control group. For example, an HIV prevention curriculum might show students who have had the intervention reporting delayed sexual initiation, fewer sexual partners, increased condom use, and/or increased communication with parents. Barriers for the use of those curricula in North Carolina's schools include cost of instructional materials, cost of professional development, unsuitability of curricular materials based on state law or local policy, or lack of awareness that effective curricula exist. Local school systems have been able to

access funding for effective programs with Safe and Drug Free Schools funding.

Proposed Solution: Commitment and Accountability

Just as the State Board of Education's Healthy Active Children's Policy has resulted in schools requiring a minimum number of minutes allocated to physical activity during the school day, a demand for increased commitment to the teaching of health is needed. Principals and teachers must be accountable for the required SCOS being taught. As tests scores have improved, new attention has been given to the percentage of

young people dropping out before graduation from high school. Health education can reduce health-related reasons for dropout such as adolescent pregnancy and drug abuse.

Teen pregnancy, alcohol and drug abuse, overweight/obesity, suicide, tobacco use, violence, HIV/STDs, bullying and harassment, and injuries are all largely preventable through skill-building health education. For health education to realize its potential to truly enhance the quality of life for North Carolinians there must be recognition by educators and the public that healthy children learn better. There must be a serious and sustained commitment by public schools for young people to achieve their optimal health as well as their academic promise. **NCMJ**

REFERENCES

- 1 Joint Committee on National Health Standards. *National Health Education Standards, K-12: Achieving Excellence*. 2nd ed. Atlanta, GA: American Cancer Society; 2007.
- 2 North Carolina Department of Public Instruction and Department of Health and Human Services. NC Youth Risk Behavior Surveillance Survey, 2007. <http://www.nchealthyschools.org/data/yrbss/>. Accessed October 3, 2008.
- 3 NC Center for Public Policy Research. *Health Education: An Incomplete Commitment*. Raleigh, NC: NC Center for Public Policy Research; 1977.
- 4 2006 School Health Education Profiles Study. NC Department of Public Instruction website. www.nchealthyschools.org. Accessed October 1, 2008.
- 5 North Carolina Association for the Advancement of Health Education. Position statement on health education. North Carolina Alliance for Athletics, Health, Physical Education, and Dance website. www.ncaahperd.org. Accessed September 25, 2008.



BE THE BOSS OF WHAT YOUR KIDS WATCH

Parental blocking controls not only prevent your kids from viewing mature content, but also allow you to decide what programs they *can* watch. Parental controls are available through your TV, cable or satellite provider.

Learn more at
theTVboss.org



What's for Lunch in North Carolina's Public Schools—Healthy Foods or Healthy Finances?

Lynn Hoggard, EdD, RD, LDN, FADA

Imagine for a moment a dining room designed for students: inviting, comfortable, and relaxing, with brightly colored walls decked with age-appropriate décor that promotes healthy foods and beverages. The room is filled with the slightly sweet aroma of school-baked whole grain yeast rolls and the fragrance of fresh fruits. Picture the vivid colors of recently washed fresh vegetables: red, green, yellow, orange, and purple. You can still see the tiny water droplets on their surfaces. Now imagine children who have just come in from recess or other physical activities; they are filled with laughter, excitement, and a healthy appetite. After stopping to wash their hands, the students proceed in an orderly manner into the dining room, which is one of their favorite places on the school campus. Upon entering, students are greeted by school nutrition personnel who know their names and who speak to each child in a tone that is uplifting and encouraging. As children begin to select their favorite foods from a wide variety of healthful, student-appealing options, they are reminded of what they learned earlier in the day about making healthy food choices when the teacher included a mini-nutrition lesson while covering the unit on fractions. Teachers and other school personnel are available in the dining room to encourage healthful choices by making positive comments about school meals and by subtly reminding students to practice what they learned in the classroom. Teachers praise students' healthful food and beverage choices, and they also serve as role models for students by making healthful food choices themselves. In this dining room, all students have the same food and beverage choices; there is no meal service for children who receive free meals and another for children who purchase their meals. All children are treated equally and respectfully. Once they make their food and beverage choices, students are seated with their peers where they are encouraged to socialize with each other in the full 20 to 30 minutes they have to enjoy their meal. They eat slowly and thoughtfully and display appropriate table manners. When they finish their meals, they return to their classrooms, well-nourished, satisfied, and prepared to learn.

What you have just imagined is the vision of thousands of child nutrition professionals for an optimal school meals environment in all of North Carolina's public schools. This vision would transform the institutional cafeterias of yesteryear into centers for the development of lifelong healthful eating habits where all foods and beverages available to students are wholesome, nutritious, appealing, and affordable.

Some of the conditions described above are already present in North Carolina's public schools. Many newly-constructed schools have dining rooms that are inviting, staffed by competent, caring school nutrition personnel who are committed to preparing and serving the highest quality, most nutritious meals possible. Every day, in every school dining room in the state, students have the option to make healthful food and beverage choices. When students select the "reimbursable meal" they are assured

“Some may ask why healthy foods have to compete with less healthful ones. The answer is simple: finances. The expectation for most Child Nutrition Programs in North Carolina is to be financially self-supporting.”

of having a meal that is consistent with the recommendations reflected in the *Dietary Guidelines for Americans*.¹ Unfortunately, the choice is not that simple. Favorites such as double cheeseburgers, french fries, big cookies, and sweetened iced tea compete with healthful foods like fresh salads topped with locally grown vegetables and low-fat dressing; sandwich wraps made with whole grain tortillas; pizza made with a hearty whole grain crust, low-fat mozzarella cheese, and an abundance of vegetable toppings; fresh fruits in season; and low-fat or skim milk.

Lynn Hoggard, EdD, RD, LDN, FADA, is the section chief of Child Nutrition Services in the Division of School Support at the North Carolina Department of Public Instruction. She can be reached at lhoggard@dpi.state.nc.us.

Some may ask why healthy foods have to compete with less healthful ones. The answer is simple: finances. The expectation for most Child Nutrition Programs in North Carolina is to be financially self-supporting. This means the program has to generate revenues from the sale of foods and beverages to students to purchase food and food preparation/service supplies, to pay salaries and benefits of school nutrition personnel, to purchase and/or repair commercial food service equipment, and to pay indirect costs to the school district. Essentially, the program has to generate enough revenue to pay for every expense borne by the program.

It hasn't always been this way. The National School Lunch Act² (NSLA) was signed into law in 1946 shortly after World War II. Military leaders were convinced the nation was vulnerable because many of its youth were malnourished and consequently were rejected for military service. To address the problem of malnutrition among the nation's youth while protecting the health and well-being of the nation, the National School Lunch Program (NSLP) was created. When President Harry S. Truman signed the NSLA, he read from the preamble of the Act which stated, "the program shall be a partnership of federal, state, and local governments." For the first four decades the NSLP was in operation, decisions made in the Child Nutrition Program were based on one guiding principle: what is in the best interest of the child? Food and beverage selections were made based on this principle; the amount of time for students to consume their meals was based on this principle; the time of day the meal was served was based on this principle. Federal, state, and local funds or in-kind support were available to support the program based on this principle.

In the early 1980s a massive federal budget-cut threatened to shut down the school meals program nationwide. Schools looked for creative ways to generate revenues to enable the program to continue to serve meals to students despite inadequate funds. Fortunately, in North Carolina, no school cafeteria closed its doors to students during this time; all continued to operate. They did so by selling extra servings of foods and beverages to students who could afford to purchase them. What was originally known as "supplemental school meal sales" that were needed to sustain the program through a budgetary crisis evolved into what is today known as the *a la carte* program. With greater emphasis placed on *a la carte* meals instead of reimbursable meals, the guiding principle for the Child Nutrition Program shifted. The principle of "doing the right thing for children" was gradually replaced with the principle "what will generate the most revenue?"

As a result of this shift in decision-making that placed the generation of revenues over the nutrition needs of students, several types of meals are offered to students in North Carolina's public schools. There are reimbursable meals, *a la carte* meals/snacks, and snacks that are vended on the school campus (which constitute meals for many students).

Reimbursable meals are prepared and served under the regulations of the federally-funded National School Lunch Program and School Breakfast Program (SBP). These meals are referred to as "reimbursable" because the US Department of Agriculture (USDA) reimburses school districts for a portion of the cost of each meal served to students. In addition to cash

subsidies, school districts participating in the NSLP and SBP receive commodity foods from the USDA to support the service of reimbursable meals. In return for the cash subsidies and commodities, participating schools must serve breakfasts and lunches at no cost or at a reduced price to students whose household incomes make them eligible for the meal benefits. In addition, breakfasts and lunches that are reimbursable must meet federal nutrition requirements.

A typical reimbursable school lunch may include an entrée, two or more servings of fruits and vegetables, a serving of a grain product, and eight ounces of low-fat or non-fat milk. Reimbursable school meals are healthy meals. Over the course of a week, reimbursable school meals must meet the nutrition standards outlined in the *Dietary Guidelines for Americans*.¹ In North Carolina, reimbursable school meals must contain no more than 35% of calories from fat and less than 10% from saturated fat. School breakfasts must provide one-fourth of the Recommended Dietary Allowance (RDA) for protein, Vitamin A, Vitamin C, iron, and calcium, while school lunches must provide one-third of the RDA for these nutrients.

Everyone benefits when children select the reimbursable school meal. Students benefit because they receive a wholesome, nutritious meal that is planned to contribute to their optimal growth, development, and success in the classroom. Research suggests that students who select reimbursable school meals consume less total and saturated fat, eat more fruits and vegetables, drink more milk, are less likely to drink sweetened beverages, and are more likely to be a healthy weight than students who select school meals from other venues. Parents benefit because the reimbursable school meal offers a convenient method of providing nutritionally balanced meals for children at school at the lowest possible price. Schools benefit because when students are adequately nourished, their academic performance improves, they have fewer attendance and discipline problems, and are more attentive in class.

In addition to reimbursable meals, students may select from a variety of foods and beverages sold *a la carte*. Unlike the reimbursable meal that is priced as a unit for all meal components, thus providing a balanced meal, *a la carte* items are priced and sold individually. Foods and beverages sold *a la carte* are often referred to as "competitive foods" because they compete with reimbursable meals for students' appetites and for their lunch money. These items are available at a much higher cost to students than the reimbursable meal. A single item may cost twice the amount of an entire meal. Nonetheless, schools generate significant revenues from these foods and beverages. In North Carolina, the most popular *a la carte* items include specialty sandwiches, french fries, pizza, cookies, snack cakes, fruit punch, chips, ice cream, sports drinks, and sweetened iced tea. Unlike the reimbursable meal, there are no nutrition standards for *a la carte* foods and beverages.

In addition to reimbursable and *a la carte* meals made available to students in the school cafeteria, there are many other food and beverage options available to students on the school campus. These options include school-operated vending machines, school stores and snack bars, school fundraisers, and school

concessions. There are no nutrition standards for foods and beverages available to students in these areas of the school campus. Like *a la carte* items, foods and beverages sold in these venues compete with the federally-funded NSLP and SBP and often undermine the nutritional, financial, and operational integrity of the NSLP and SBP.

Food and beverages are not the only competing factors in the school day. There is also competition for students' time. With increased emphasis on in-class time, the amount of time students have for breakfast and lunch is shrinking. The average time for breakfast is 12 minutes and for lunch it is only 17 minutes. When pressed, students turn to vending machines for breakfast and lunch, even when healthful foods and beverages are available in the school meals program.

When students consistently replace healthy reimbursable school meals with less nutritious foods and beverages, such as *a la carte*, vending, or other meal/snack options, there is a risk their diets will lack key nutrients needed for optimal growth and academic performance. Likewise, when competitive foods are purchased in large quantities, there is likelihood of over-consumption and the potential for unhealthy weight gain.

Concerns about the soaring rates of childhood obesity have drawn attention to the importance of healthy school meals and snacks. In 2005, the North Carolina General Assembly (NCGA) enacted legislation to require the State Board of Education (SBE) to adopt nutrition standards for all meals and snacks served in public schools. Shortly thereafter, the SBE adopted nutrition standards for foods and beverages in elementary schools. Before the standards were adopted, they were tested in 124 elementary schools. The test of nutrition standards in elementary schools revealed their implementation would require an investment of \$20 million annually or approximately \$25 dollars per student per year. For two consecutive years, the SBE has placed funding for healthier school meals among their top five priorities in their budget request to the NCGA. Unfortunately, funds have not been appropriated to support healthier school meals in elementary schools. As a result, the mandatory requirement to implement the standards has been delayed until 2010.

Despite the lack of funding, Child Nutrition Administrators who are committed to restoring the guiding principle of "doing the right thing for children" to the Child Nutrition Program began to implement the SBE-adopted nutrition standards in elementary schools. They also gradually removed less healthful foods and beverages from middle and high schools. Sweetened beverages, cookies, desserts, salty snacks, and fried foods were among the items that were disappearing from *a la carte* menus. Currently, over 95% of elementary schools have successfully implemented the SBE-adopted nutrition standard even without the necessary financial support to do so.

Unfortunately, the cost of implementing nutrition standards in elementary schools, combined with the increased operating costs (including escalating food, fuel, labor, equipment, and indirect costs) has proven to be cost prohibitive. Currently, the

majority of school districts in the state are operating at a significant financial loss. In order to generate revenues to support the program, most districts have had no options but to include less healthful foods and beverages into their school meals programs. With no other funding sources, schools have to resort to selling foods and beverages that will generate revenues for the district. This means low-cost, high calorie foods and beverages like french fries, cookies, fruit punch, and other sweetened beverages are returning to North Carolina's school cafeterias. Once again, healthy school foods have taken a back seat to healthy school finances.

Despite this setback, many student advocates remain committed to the vision of an optimal school nutrition environment, an environment where students receive consistent, reliable information about healthful food and beverage choices and have the opportunity to use the information when making food and beverage selections; where school administrators, teachers, and support staff provide the same clear and consistent messages that reinforce healthy eating habits; where foods and beverages offered to students in the school meals program, in vending machines, in school stores, and at student events reflect and model these messages; where lessons in the classroom are reflected in food choices available in the dining room; and where school personnel are role models for healthy lifestyle behaviors, including the development of healthful eating habits.

I believe the vision can become the reality in North Carolina's public schools. But achieving the vision will require the following actions:

- Students, parents, educators, and community leaders must take an active role in supporting an optimal school nutrition environment.
- Adequate federal, state, and local funds must be provided to ensure the total school environment supports the availability of healthful foods and beverages for students.
- Nutrition standards must be established for all foods and beverages available on the school campus; those standards must be achievable, affordable, and appealing to a diverse student population.
- Students must have a designated meal period of sufficient length to enjoy eating healthy foods, and meal periods should be scheduled at reasonable times during the day.
- Behavior-focused nutrition education must be integrated into the curriculum from pre-K through grade 12 and teachers who provide nutrition education must have appropriate training to do so.
- Decisions regarding the sale and availability of foods and beverages on the school campus must be based on student health and well-being, not on making a profit.

Please consider embracing the vision for an optimal school nutrition environment in our public schools and becoming advocates for making the vision become a reality. I think you will agree it's the right thing to do for children. **NCMJ**

The Child Nutrition Services Section of the North Carolina Department of Public Instruction administers the eighth largest Child Nutrition Program in the nation. Each day, school nutrition personnel in 115 school districts prepare and serve meals for nearly 1.4 million students, half of whom are economically disadvantaged

and qualify for free or reduced-price meals at schools. A healthy school lunch is available to all students every day; the majority of elementary and middle schools provide school breakfast and many elementary schools provide an after school snack for students.

REFERENCES

- 1 US Department of Health and Human Services and US Department of Agriculture. *Dietary Guidelines for Americans* 2005. Washington, DC: Government Printing Office; 2005.
- 2 Public Law 79-396. Stat. 281, Sect. 2. National School Lunch Act (1946).

Eat Smart, Move More Health Tip



Enjoy More Fruits and Veggies

What are low in calories, full of essential nutrients and can help reduce your risk for chronic diseases? Fruits and vegetables! Make fruits and vegetables half your plate at every meal and for every snack. Fresh, frozen, dried, canned—it all counts. Shake things up by enjoying a variety of colors to stay healthy and fit. Your body will thank you.

For more tips on how to eat your fruits and veggies every day where you live, learn, earn, play and pray, visit

www.EatSmartMoveMoreNC.com



Accountability Means Quality Physical Activity

Ernest Holcomb

We have a big health problem in North Carolina and in our nation. The problem is that our children have become too big for their health. Reading the daily news or searching the internet offers all the facts necessary to support the need for Americans to move more and eat less. While we're at it, we could eat smarter, too. It is no surprise that schools are again the "chosen ones" to solve this super-sized problem; schools are the one common place where nearly all children spend a great deal of time in their formative years.

Understand that there are only three real determinates of health—heredity, personal choice, and environment. Research continues to show that attitudes and habits established early in life more often become adult lifestyle factors. Quality physical education, physical activity, and health education nurture positive attitudes towards physical fitness and wellness. What happens when students take part in a quality school-wide K-12 program to improve attitudes around physical activity? Decreased waistlines, improved academic performance, knowledgeable students/adults, and a better chance for a healthier state and nation. We can also expect reduced health care costs, increased student/employee productivity, and lower school and workplace absenteeism. In order to slay the childhood obesity monster in North Carolina, it is imperative that we understand the history of this giant.

Activity time in elementary school once meant recess where children played freely, with little organization. Organized physical education usually began for the child in middle grades and was a required yearly class. Some high schools required two or more units of physical education for graduation along with a unit of health education. With the expansion of college admission requirements in the 1970s, school boards began slicing units from nonacademic subjects. Sincere physical educators across the state were alarmed and objected while envisioning playgrounds with super-sized kids and oversized swings. For more than 30 years we have fought to reinstate those lost units of physical education in our schools.

In the early 1990s, the North Carolina Department of Public Instruction (NCDPI) began the long process of writing

an end of course (EOC) test for health and physical education (HPE). Initially, it would begin as a written test, but many physical educators saw it as a move that would eventually lead to a physical exit test as well. That effort ended after less than one year when the state department decided to reallocate monies to rewrite the biology EOC. To date, the HPE-EOC is still on a shelf somewhere in downtown Raleigh. In more recent years, we have seen middle school health and physical education classes slashed to make room for computer skills and other such requisites. We now find some middle schools facing gym classes of over a hundred students per period and some without health education being taught at all.

“What happens when students take part in a quality school-wide K-12 program to improve attitudes around physical activity? Decreased waistlines, improved academic performance, knowledgeable students/adults, and a better chance for a healthier state and nation.”

The complexities continue to mount as we presently battle fast foods, poor nutritional habits in many homes, and kids who find more enjoyment playing with MP3 players and computers than playing with friends or in organized sports. Our schools are being driven by state test scores (EOGs and EOCs) and anything else that is required to justify state funds. At present, our state requires 150 minutes of activity time per week for elementary students (K-5) and 225 minutes per week for their

Ernest Holcomb is a National Board Certified (NBCT) physical education teacher with Rockingham County Schools. He can be reached at eholcomb@rock.k12.nc.us.

Use the Holistic Approach

Along with quality physical education and activity programs, children should receive quality health education. The two should complement each other and be taught holistically, interweaving topics from the classroom to the activity area. This holistic approach will strengthen student knowledge and assist in a view that health and wellness issues are important aspects of everyone's life. Since presenting at several state conventions, I am fully convinced that health and physical educators have some of the most creative minds among all disciplines. If we could harness the aptitude levels demonstrated during working sessions, health and physical educators can be the force that bonds all other subject areas in an interdisciplinary approach.

The American Association for Health Education (AAHE) also falls under the American Alliance for Health, Physical Education, Recreation, and Dance, and this organization, along with our state level North Carolina Association for the Advancement of Health Education and numerous government and private agencies, dedicate themselves to the ongoing work of health education. All that is needed is a click on the websites of these organizations and the time to research and/or request information.

Supporting agencies abound for physical activity, physical education, and health education from the local level to the state level and across the nation, from the Centers for Disease Control and Prevention to the President's Council on Physical Fitness and Sports. With so much information available, we must stay updated and consistently communicate information to our students. Powerful lesson plans should be linked to the national and state standards; there is really no excuse for a sub par lesson to exist.

secondary counterparts. While many principals work diligently with scheduling, others count those minute requirements like pennies in a poker game, astonishingly even counting the walk to and from the cafeteria as part of the weekly total.

To complicate matters further, many middle and high school administrators find it necessary to fill coaching voids with individuals willing to coach regardless of their teaching talents or interests. While some of our best coaches are also excellent, caring physical education and health educators with great impact on young people, in far too many schools we have the gyms filled with coaches waiting for the school day to end so they can get on to practice. To add insult to injury, the 225 minutes for high school students can only be reached if we do some creative computing due to block scheduling and a one semester course that requires both academic (health) and activity (physical education) time.

While many parents see our outstanding athletes performing during sporting events, this provides a skewed view of the overall health status of our students. It is not the athletes who are most often at risk when studying childhood obesity charts; it's the average kid, the one who hops on a yellow bus or in a car at the end of each school day and moves little until the next morning. Our physical education and health education programs must be about all students, not just those valued on the athletic field or those who specialize in acquiring our attention.

To understand the needs of schools, we must first understand the difference in the terms involved. There is a difference between physical education and physical activity: "Physical activity is critical to the development and maintenance of good health. The goal of physical education is to develop physically educated individuals who have the knowledge, skills, and confidence to enjoy a lifetime of healthful physical activity."¹ We need to provide opportunities for physical activity in and out of the classroom. To be healthy, children need to move, and often this includes not only directed recreation, but also creative, passionate play. On the other hand, "quality physical education [will help] all children develop health-related fitness, physical competence, cognitive understanding, and positive attitudes about physical activity so that they can adopt healthy and physically active lifestyles.

Quality physical education programs are also important because they provide learning experiences that meet youngsters' developmental needs, which in turn helps to improve their mental alertness, academic performance, and readiness and enthusiasm for learning.² Athletics, besides being one of the best dropout prevention programs ever, continues to provide

Reinvent Yourself

A growing concern about the number of high school students not enrolling in our elective physical education courses at Reidsville High School led to the creation of a fitness/wellness course entitled Healthy Living. The vision was to entice at least 30 upper-class students to participate for a trial semester. To the delight of our administration, well over 100 students enrolled that inaugural year and the numbers remain consistent since the course began three years ago. Healthy Living includes a variety of fitness disciplines from yoga, Pilates, and exercise ball routines to body sculpture, stretch bands, aerobics, and dance plus cardio-work complete with heart rate monitors and core training. In addition, students design and deliver biweekly fitness/wellness sessions at local elementary schools to promote their love for healthy living and to serve as role models. Our periodic assessments continue to show inches lost, pounds shed, and body fat composition lowering. Similar courses are showing up across the state and nation as physical educators are redefining their means and methods to attract students wishing to explore new fitness interests and learn new skills and knowledge for a lifetime of healthy activity.

excellent outlets for physical vigor, cooperation, and in most cases, both character education and sportsmanship.

Thomas Jefferson said, "A child who is not physically well cannot learn." Keeping school-age children and school districts invested in quality physical education, physical activity, and health education programs requires only one thing—accountability. Many school-level needs listed by NCDPI or some agency require mounds of money to implement—money that districts and administrators seldom have. However, it only takes some simple steps to get and keep quality in the activity arena. Programs such as Fit 4 Learning³ have proven that daily activity, even within the classroom itself, can contribute to academic growth. Many of the state's "smartest" elementary schools (according to EOGs) require daily classroom activities, often referred to as ice breakers, brain breakers, or energizers, in addition to organized, scheduled physical education conducted by a licensed physical educator.

With this in mind, we must focus on the issue at hand—investing in physical activity. We are fortunate to have some of the best people and organizations available at our fingertips when it comes to establishing quality physical education and activity programs within our schools. Professional organizations like the American Alliance for Health, Physical Education, Recreation, and Dance (AAHPERD),⁴ along with our district and state associations, are an outlet for much more than new games and activities. A mountain of information can be obtained by simply visiting the AAHPERD website. There are six associations under this umbrella and interested educators, administrators, and school board members visiting the NASPE link will be stunned by the amount of information in the physical domain alone. On this site, a link to the "Principals Page" will disclose such topics as suggested job interview questions for prospective physical education teachers, physical education vs. physical activity, quality physical education, physical education program checklist, and mostly importantly, national standards for physical education.

School principals who are serious about teaching the whole child would do their students justice by requiring the HPE department to rate themselves by using the STARS Program criteria. The NASPE site also offers a monthly "Tool Box" and "Archives" full of games and activities, many of which can be modified to fit school-level needs and facilities. On the state level, North Carolina offers physical educators an abundance of material and information through NCAHPERD's yearly conventions, periodic workshops, and publications. The North Carolina Physical Education Association (NCPEA) provides an assortment of sessions at the state convention and also at workshops throughout the year. Programs at these sessions are outstanding, meet all listed standards, and provide effective suggestions for working with kids. We are fortunate in North Carolina to have such creative and dedicated physical educators. The goal should be to get this level of professionalism in all of our school activity classes. Administrators should allocate existing funds so their physical educators can take advantage of these opportunities and do follow up sessions to assure meaningful, quality activities are making their way back into lesson plans.

Implementing North Carolina's Healthy Active Children Policy

Heather D. Pope

In today's environment of television, computers, and video games, healthful living is a skill that must be taught and a habit that must be formed early. North Carolina has recognized this need. In 2003, our State Board of Education began discussing a policy that would mandate 30 minutes of daily physical activity for school children in grades K-8. The policy, referred to as the Healthy Active Children Policy (HAC), was mandated by state law in 2005.¹ Thanks to grant monies from the Health and Wellness Trust Fund, teachers in North Carolina get free training and resources to aid in policy implementation.

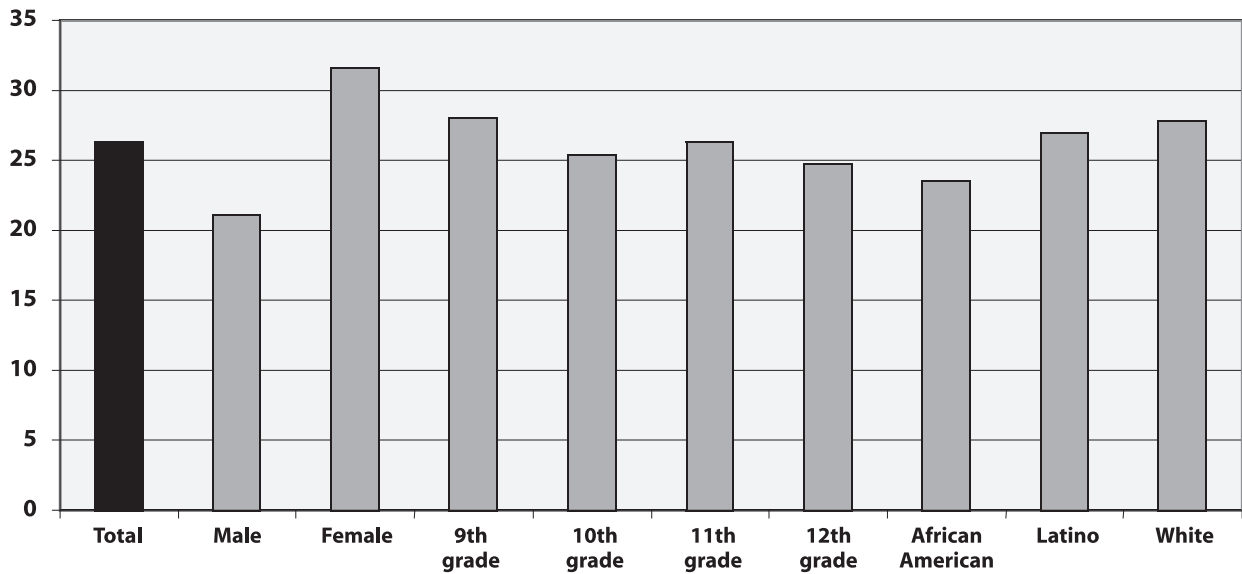
As an HAC trainer I have seen many classroom teachers go from trepidation to excitement when hearing of the program and seeing the available materials. When talking to a group of middle school teachers in Wake County I was emphasizing again that our kids desperately need to get up and *move*. I was surprised and delighted when a science teacher stood up, looked at her principal, and said, "I told you so!" Despite this initial positive reaction to integrating additional physical activity into our students' school days, there are quite a few schools across the state that are noncompliant.

In Lenoir County, we feel that we have identified a way to aid our schools to be in full HAC compliance. Thanks to the Zone Health Program, featured on page 483, which gave us the tools we needed to evaluate all of our health, physical education, physical activity, and nutrition policies and procedures, we identified some barriers to the success of the Healthy Active Children Policy in our schools.

Educators including teachers, principals, and central office staff are all under tremendous pressure to produce test scores that demonstrate Adequate Yearly Progress (AYP) as mandated by the educational directives of No Child Left Behind (NCLB). A majority of our energy, focus, time, and money is spent toward this endeavor. Schools and school systems who do not meet AYP can lose much-needed federal funding. Since most schools are already underfunded, it is obvious why so much effort is put toward meeting this goal.

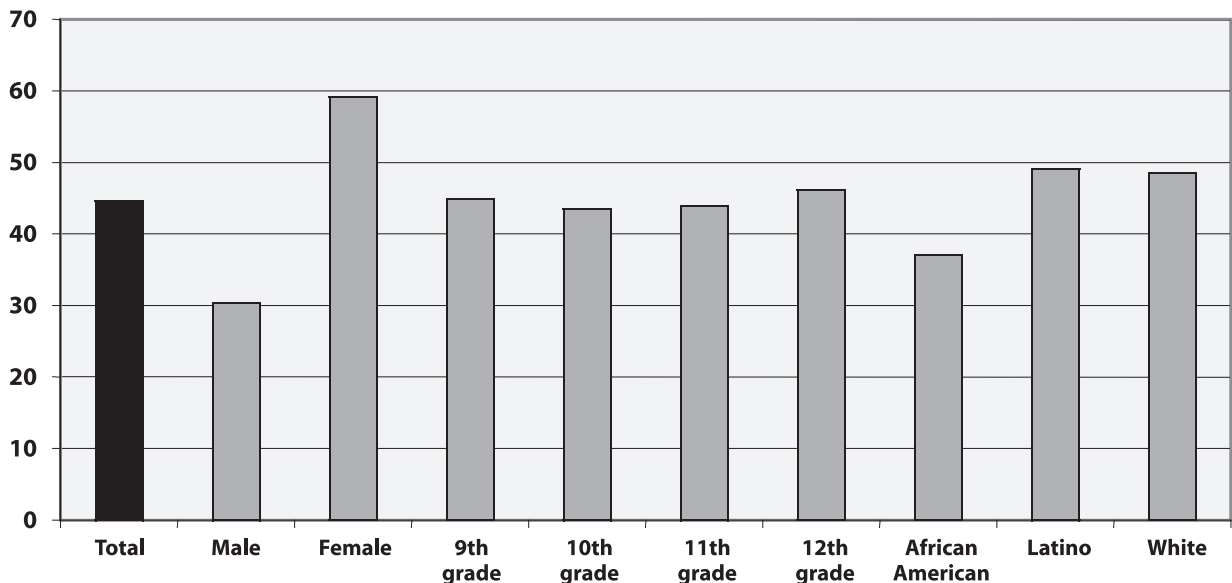
The HAC training addresses physical activity's benefits for increased brain function and learning along with health benefits. Since the training is designed for classroom teachers, not all principals and few central office staff have attended a training session. These are the individuals who most often make decisions about

Figure 1.
Percentage of Students Who Described Themselves as Slightly or Very Overweight, 2007^a



Source: North Carolina State Center for Health Statistics. 2007 North Carolina Youth Risk Behavior Survey. <http://www.nchealthyschools.org/data/yrbs/>. Question 65; weighted data.

Figure 2.
Percentage of Students Who Were Trying to Lose Weight, 2007^a



Source: North Carolina State Center for Health Statistics. 2007 North Carolina Youth Risk Behavior Survey. <http://www.nchealthyschools.org/data/yrbs/>. Question 66; weighted data.

^a Figure 1 indicates that only 26% of all high school students perceive themselves as slightly or very overweight. In Figure 2, results show that almost 45% of those reporting are trying to lose weight. In both figures, females lead males in the percentage of students who may be influenced by societal expectations and stereotyping. While Figure 1 does not coincide with higher state and national obesity statistics, the alarming issue is that many high school students do not view themselves as overweight or are simply accepting of their health status. Figure 2 may indicate that some students do desire weight loss but more for appearance or cosmetic reasons than for improving their health status. More opportunities for the dissemination of health and physical education information in earlier school years could help offset this cognitive position.

In addition, Kymm Ballard, NCDPI consultant for physical education and athletics K-12, has worked tirelessly to align our state standards with those on the national level, thus allowing communication between administrators and physical educators to take place on a level playing field. And if money is actually a problem, both the national and state associations offer many grant opportunities.

There's a new physical education today and physical educators who have not waded into these waters are, along with their students, missing out on numerous fresh, fun methods to achieve fitness. Adventure classes, fitness classes, aerobic/dance classes, and personal training classes must be included as current student options, and teachers must be willing to reinvent themselves to keep up with the changes. The old days of sport games and weight lifting classes still have a place in the registration booklet, but the new listings are what a lot of kids are looking for today. It's not rocket science and it does not take a lot of money—just personal and administrative accountability.

In education today, the buzz words are 21st Century Learning and No Child Left Behind. 21st Century Learning is a framework of skills, knowledge, and expertise students should master to succeed in both the work place and in life. Core subjects are clearly focused in themes; however, a deeper study of the model reveals that along with standards and assessments there are life skills which fall under learning and innovation. These skills include critical thinking, problem solving, communication, and collaboration—all skills which are included daily in quality physical education classes. As physical educators we must expose our students to these skills while capturing the interests and attention of the students we teach each day. Our charge should be not only to facilitate classes based on the standards but also to inspire students with a variety of activity options that can be enjoyed for a lifetime.

In addition to that inspiration for students comes the inspiration we must provide to our colleagues through Staff Wellness Programs. In 2004, the Child Nutrition Reauthorization Act was signed into law; one aspect includes the development of wellness guidelines for students and staff with goals for physical activity and other school-based activities. For educators this means structured after school programs, activity breaks during meetings, and staff icebreakers on workdays. The impact on students is through powerful role modeling—actions speak louder than words.

Since our state's HPE-EOC appears to have been abandoned, district accountability could still be promoted with the inclusion of quality physical education for all children covered by the No Child Left Behind (NCLB) Act. What we need is a No Child Left *on Their* Behind Act. Along with a new beginning of accountability in school-level physical activity would come the attention needed to assure attitude changes necessary to sustain the changes. Accountability or the AYP (Average Yearly Progress) can be pushed by the periodic assessments of each and every student in North Carolina. These assessments can be body mass index testing, or better yet, a test that encompasses all five health related components: cardio-respiratory endurance, muscular strength, muscular endurance, flexibility,

scheduling and what is expected of teachers in their classrooms. If these individuals do not understand the importance of HAC or what is required of their teachers to be in compliance with the policy, then following the policy will not be a priority. As a result, we cannot expect their teachers, schools, and school systems to make it a priority.

Our solution to the problem of HAC noncompliance is to give a short presentation to principals and central office staff highlighting how physical activity improves learning. There has been a growing body of research indicating that healthy children, fit children, children who are not overweight or obese, children who attend regular physical education classes, and children who are physically active are more successful in school and perform better on standardized tests such as those driving NCLB and AYP. We will draw on these research findings as well as the in-depth brain research Dr. John Ratey discusses in his book *Spark*² to help demonstrate to our educational leaders that physical activity is not only critical for our students' health, but for their ability to learn as well. Since student health and wellness, in addition to learning, is important to us in Lenoir County, it is our goal to ensure full HAC compliance as a result of the presentation.

Heather D. Pope is a physical education teacher at Contentnea Elementary School. She can be reached at hdudley@lenoir.k12.nc.us.

REFERENCES

- 1 North Carolina Department of Public Instruction. *North Carolina State Board of Education Policy Manual [HSP-S-000]*. North Carolina Department of Public Instruction website. <http://www.ncpublicschools.org/docs/curriculum/healthfullivng/resources/policy/healthychildren/sbepolicymanual.pdf>. Accessed November 5, 2008.
- 2 Ratey JJ, Hagerman E. *Spark: The Revolutionary New Science of Exercise and the Brain*. New York, NY: Little, Brown, and Company; 2008.

and body composition—all of which are currently found in the Physical Best Program. The President's Challenge would be another good alternative; it has been used for decades to recognize youth fitness and develop national norms for assessments. Regardless of the assessment model used, it would be the AYP that provides the push.

But ongoing assessments must come with a comprehensive, coordinated K-12 program designed to meet goals and state and national standards while still attracting prevailing student interests. Assessments should follow students, be based on individual improvement, and eventually be used as physical exit tests. It only takes the leadership of the right person, whether it be a legislator, a school board member, or educator to maximize the many opportunities. And let's not forget that regardless of laws and mandates, what counts is what goes on behind the gym

doors or during the class activity time; without accountability, however, it is the children who literally lose or gain.

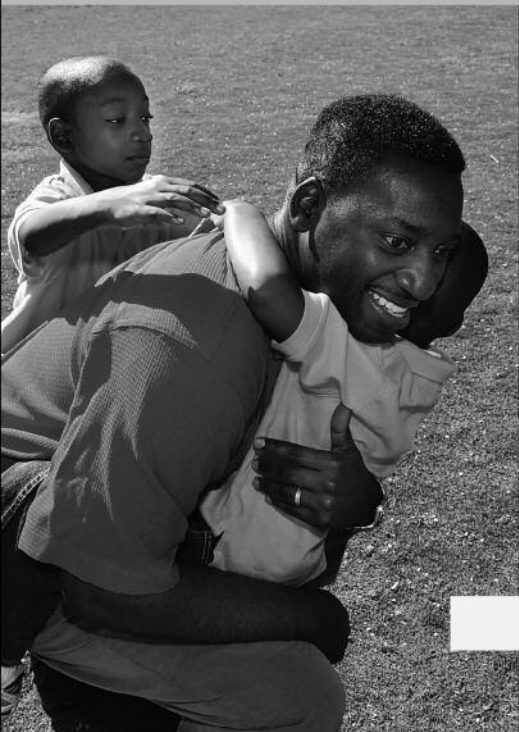
With accountability, physical education will no longer be the scapegoat for other subjects, and a playground will no longer be for overloaded classes or a refuge for undisciplined students. State, district, and local administrators would have accountability models to meet themselves, and only then will we be assured that we are all moving in the same direction, without fear of skilled school board surgeons trimming away physical activity which is necessary for lifelong health and fitness. **NCMJ**

Ernest Holcomb is the second teacher in North Carolina to ever receive both the state Physical Education and Health Education Teacher of the Year (TOY) Awards. He has also received the Southern District Physical Education Award for secondary education and was named a National Association of Sports and Physical Education Teacher of the Year (NASPE TOY) in 2006. Mr. Holcomb is currently in his 36th year of teaching and coaching. He was named both the State and National Federation of High School Sports Southern Section Baseball Coach of the Year in 2005.

REFERENCES

- 1 Physical Education vs. Physical Activity: Position Statement. National Association of Sport and Physical Education website. <http://www.aahperd.org/naspe>. Accessed September 28, 2008.
- 2 Quality Physical Education: Position Statement. National Association of Sport and Physical Education website. <http://www.aahperd.org/naspe>. Accessed October 2, 2008.
- 3 Fit 4 Learning. <http://www.fit4learning.com>. Accessed October 5, 2008.
- 4 American Alliance for Health, Physical Education, Recreation, and Dance. <http://www.aahperd.org>. Accessed September 28, 2008.

Eat Smart, Move More Health Tip




Tame the Tube— and Get Moving

Many of us say we don't have time for physical activity, yet we spend 3 to 4 hours in front of the TV. Not only are we inactive while watching television, we often snack on high-calorie foods at the same time. Trade TV time for physical activity. Walk or bike with your family after dinner. By planning TV time, you'll have more time for physical activity.

For more tips on how to tame the tube where you live, learn, earn, play and pray, visit

www.EatSmartMoveMoreNC.com



Programs Addressing Health in North Carolina's Schools

David K. Jones

Because children spend such a large portion of their time in school, it is important that schools are healthy settings. Many organizations have designed programs to help schools increase physical activity, improve nutrition, and reduce substance use. The following is a list of some of these programs, including a brief description of what the program does, how to contact their organization, and where to learn more. Many of these programs are specific to North Carolina, whereas others are national programs which also serve North Carolina's schools. This list is not comprehensive, but exemplifies the types of resources available. Information presented here comes from each program's website.

100% Tobacco-Free Schools

Funded by the Health and Wellness Trust Fund (HWTF), 100% Tobacco-Free Schools is an initiative for all schools in North Carolina to prohibit tobacco use by anyone, anytime, and during all school-sponsored events. The NC Tobacco Prevention and Control Branch collaborates with the HWTF to promote tobacco-free schools. The campaign includes television commercials and a website full of resources for school administrators, teachers, parents, and students.

www.tobaccofreeschoolsnc.com

Alice Aycock Poe Center for Health Education

Created in 1991, the Poe Center has a number of interactive lessons designed to be entertaining for children in preschool through 12th grade. These include lessons on general health, nutrition, physical activity, dental health, drug education, and family life. Educational programs are done in specially-designed theaters located at the Poe Center in Raleigh.

www.poehealth.org

Alliance for a Healthier Generation

The Alliance for a Healthier generation is a partnership between the American Heart Association and the William J. Clinton Foundation focused on reducing the prevalence of childhood obesity in the United States. Programs are designed to focus on many settings affecting a child's health, including homes, restaurants, doctor's offices, communities, and schools. Participating schools receive a tool called the "Healthy School Builder," which assesses what improvements can be made, including increasing physical activity levels, increasing healthy food options in cafeterias and vending machines, and helping teachers become healthy role models. A number North Carolina schools have been highlighted and have received awards from the Alliance for a Healthier Generation, including Scotland Neck Primary in Scotland Neck, Pittman Elementary School in Enfield, and McIver Elementary School in Halifax County.

www.healthiergeneration.org/schools

ATLAS & ATHENA

Athletes Training and Learning to Avoid Steroids (ATLAS) is designed to prevent the use of alcohol, illegal drugs, anabolic steroids, and other unhealthy sports supplements among 13 to 19 year-old male high school athletes. Athletes Targeting Healthy Exercise & Nutrition Alternatives (ATHENA) does the same for female high school athletes. Interventions for a sports team are done through training sessions which promote healthy nutrition and exercise as alternatives to substance use. ATLAS and ATHENA have been recognized as model programs by the US Department of Health and Human Services and exemplary programs by both the US Department of Education, and the US Department of Juvenile Justice. The programs were created by the Division of Health Promotion and Sports Medicine at the Oregon Health & Science University.

<http://www.ohsu.edu/hpsm/>

Be Active North Carolina

Be Active North Carolina is a nonprofit organization focused on increasing physical activity levels in North Carolina through engaging in grassroots advocacy, creating model programs, and promoting positive health policies. They provide resources targeted to educators, health professionals, families, employers, individuals, and communities. This includes training for all certified teachers in North Carolina about how to meet physical activity requirements. Programs geared for students include the Active Steps Youth Program, with a kit which includes pedometers, curriculum resource guides, posters, log cards, stickers, incentives, and a walking music CD.

www.beactivenc.org

Fit Kids

Sponsored by the North Carolina Health and Wellness Trust Fund, Fit Kids helps schools find ways to meet physical activity requirements, and helps parents make healthier choices with their children. The Fit Kids website provides a large number of resources for schools, parents, and community leaders.

<http://www.fitkidsnc.com/>

Lions-Quest

Sponsored by the Lions Clubs International Foundation, Lions-Quest runs three programs—Skills for Growing, Skills for Adolescence, and Skills for Action—which provide resources for educators to teach life skills. Specifically, the programs aim to reduce risk factors encouraging drug use; help families, schools, and communities work together in discouraging drug use; establish normative beliefs that drug use is not the norm; and encourage factors such as peer influence that help prevent drug use. Lions-Quest has been recognized as a select program by the Collaborative for Academic, Social, and Emotional Learning (CASEL) and as a model program by the Center for Substance Abuse Prevention of the US Department of Health and Human Services.

www.lions-quest.org

North Carolina Action for Healthy Kids

Action for Healthy Kids is a partnership of more than 60 national private and public organizations focused on improving children's health, with teams in every part of the country. The North Carolina team worked with the NC Division of Public Health, the NC Department of Public Instruction, and the NC Cooperative Extension Service to create documents supporting the *Eat Smart Standards*, which address classroom celebrations, fundraising, rewards and incentives, school concessions, school stores, and vending. Resources and information are available on their website.

www.actionforhealthykids.org

North Carolina Alliance for Athletics, Health, Physical Education, Recreation and Dance (NCAAHPERD)

NCAAHPERD is an alliance of six organizations focused on improving health in North Carolina: The Dance Education Association of NC (DANCE), the NC Association for Athletic Education (NCAAE), the NC Association for the Advancement of Health Education (NCAAHE), the NC Sports Management Association (NCSMA), the Physical Education Association (PEA), and the Student Majors Association (SMA). NCAAHPERD brings professionals and students in each of these fields together to promote effective programs and further research. One way this is

accomplished is through publication of the *North Carolina Journal* twice a year.

www.ncaahperd.org

Project ALERT

Project ALERT describes itself as "a skills-based curriculum that teaches teens how to say no." The program includes training for educators on three core strategies: motivating students against drug use, providing skills and strategies to resist drugs, and establishing new non-use attitudes and beliefs. The program was developed and has been evaluated by the RAND Corporation. The Project ALERT website describes results from the RAND evaluation which include a 30% reduction in marijuana initiation, a 60% decrease in current marijuana use, and a 20% reduction in past month cigarette use. Project ALERT has been endorsed by the National Middle School Association.

www.projectalert.best.org

Successful Students Eat Smart and Move More

Successful Students Eat Smart and Move More is a "social marketing intervention intended to create a buzz around school wellness policies." The program helps schools implement, monitor, evaluate, and modify policies which improve the health of their students. Resources and other materials are available for download on their website.

http://www.eatsmartmovemorenc.com/programs_tools/school/successful_students.html

Zone Health

NC Prevention Partners (NCP) created Zone Health to help schools assess nutrition and physical activity policies and develop specific objectives to improve the health of their students. The program helps schools: (1) form a school wellness team; (2) assess the school's obesity environment, including policies, environments, and programs; (3) prioritize needs and develop an action plan; (4) implement changes using evidence-based resources; (5) write policies that support healthy weight; and (6) monitor and evaluate success over time. Once schools have identified priorities that they wish to address, Zone Health points them to existing programs and resources that can help them achieve those goals. Training and technical assistance are offered to schools through Prevention Institutes, community trainings, and ongoing contact through phone and emails.

NCP has also partnered with the State Board of Education to share the lessons learned with participating schools in their efforts to combat childhood obesity.

The program is made possible with support from GlaxoSmithKline Community Partnerships.

www.ncpreventionpartners.org/schools

David K. Jones is a Jim Bernstein health policy scholar at the North Carolina Institute of Medicine. He can be reached at dkjones@email.unc.edu.

School Nurses, Counselors, and Child and Family Support Teams

Tony Troop; Carol P. Tyson, RN, MPH

Healthy children are healthy learners. When school nurses first appeared in schools in the year 1902, their role was to reduce absenteeism through the management of communicable diseases.¹ Research continues to show that fewer children leave school before the end of the school day due to medical reasons when a full-time school nurse is available.² Across North Carolina, there are approximately 1,150 school nurses working in more than 2,300 schools and serving 1.4 million students.³ North Carolina's average ratio of school nurses to students currently is 1:1,225. Through the efforts of the Division of Public Health, the General Assembly, the Division of Public Instruction, local health departments, local education agencies, local hospitals, and communities across the state, we are slowly moving towards the nationally recommended ratio of 1:750 for the general school population.

The seven roles of school nurses as defined by the National Association of School Nurses and discussed by the American Academy of Pediatrics in their May 2, 2008, policy statement³ are as follows:

- (1) The school nurse provides direct health care to students and staff. In North Carolina, during the school year 2007-2008 school nurses worked with more than 237,000 children with chronic health conditions and provided case management, medication administration, nursing procedures ordered by the appropriate health care provider, and preventive health interventions and counseling.
- (2) The school nurse provides leadership for the provision of health services. As the only health care provider in the school setting in many schools, the school nurse plans for
- (3) The school nurse provides and facilitates screening and referral for health conditions. Almost one million screenings were conducted on behalf of school children last year for vision, hearing, dental health, body mass index, and blood pressure.
- (4) The school nurse promotes a healthy school environment. School nurses across North Carolina work with their school staff to assure that children are appropriately immunized, that appropriate exclusion for infectious illnesses occurs, and that schools are safe and healthy environments. More than 65,600 students received health counseling from school nurses last year for issues such as depression, substance abuse, tobacco use, violence, grief, and other health issues.
- (5) The school nurse promotes health. School nurses in North Carolina provided more than 25,800 programs and

“The ultimate goal of these...services is that healthy, stable students will be able to develop a mastery of core academic skills, will be better prepared for the demands of higher education ...and will achieve economic and personal independence.”

a All North Carolina data in this commentary are from the 2007-2008 North Carolina Annual School Health Services Report collected by school nurses across the state and compiled by the Children and Youth Branch of the Division of Public Health.

Tony Troop is the CFST program development director in the Women's and Children's Health Section of the Division of Public Health. He can be reached at tony.troop@ncmail.net.

Carol P. Tyson, RN, MPH, is the school health unit manager in the Children and Youth Branch of the Division of Public Health.

presentations last year on topics such as first aid, chronic disease management, medication administration, and healthy lifestyles.

- (6) The school nurse serves in a leadership role for health policies and programs. All local health departments in the state develop memoranda of agreement with each school district in their jurisdiction that provide an avenue for collaboration. School nursing policies guide school nursing practice, assuring health and safety in schools.
- (7) The school nurse is a liaison between school personnel, family, health care professionals, and the community. They participate in the development of individual education plans to meet special education needs of students and plan for the reasonable accommodations for students' special needs that have an impact on their educational programs. School nurses made more than 12,300 home visits last year to work with the families of students they serve.

Currently 41% of nurses working in schools across the state hold national school nurse certification, and nearly 80% of all school nurses have earned a baccalaureate degree or higher. The state school nurse consultant and the six regional school nurse consultants guide and advise school nursing practice and provide training and continuing education through workshops and conferences for school nurses.

In addition to school nurses, there are school-based and school-linked health centers across the state in at least 52 locations providing primary and preventive health care to children and adolescents. These school health centers offer access to health care, early identification and treatment of disease and injury, and easy access to counseling on avoiding risky behaviors. The Children and Youth Branch provides technical assistance, monitoring, and credentialing for school health centers and collects data about their services. In the 2006-2007 school year, the 28 centers that receive partial funding from the state reported more than 47,000 visits for children ages 10 to 19. Of all the preventive visits made to school health centers, 28% were for immunizations, 45% for risk assessments and counseling, and 27% were classified as well-child visits. School health centers are staffed by physicians, nurse practitioners, physician assistants, nurses, registered dietitians, mental health professionals, and health educators. They are funded through a combination of state, local, and federal funding; private grant funding; in-kind support; and revenues collected from fee-for-service billing.

It is recognized that meeting the basic needs of students by ensuring that they are safe, healthy, and ready to learn is central to improving their academic performance. In 2005, Governor Michael F. Easley established the School-Based Child and Family Support Team Initiative (CFST) to help every child have an opportunity to succeed in school by establishing a system to serve students facing physical and mental health problems as well as social, developmental, legal, or academic problems in

their lives. The mission of the CFST is to provide appropriate family-centered, strengths-based community services and supports to children at-risk of school failure or out-of-home placements as a result of the physical, social, legal, emotional, and developmental factors that affect their academic performance.

The CFST established 100 school-based teams in 21 Local Education Agencies (LEAs) across North Carolina. The teams consist of a nationally-certified school nurses and licensed school social workers assigned to work full-time in selected schools. These teams work with identified liaisons at local mental health agencies and departments of social services and with staff members from local health departments and the juvenile courts to make sure students and families receive appropriate community based services as quickly as possible. The teams are responsible for providing information concerning CFST services to anyone who may make referrals. Anyone may refer a student to the CFST. Referrals may be received through the use of standardized forms, face-to-face and telephone conversations, email messages, Student Assistance Team discussions, and other methods. The CFST teams also proactively identify at-risk students by using absentee, truancy, and disciplinary information maintained by the school systems. According to data entered into the case management system, more than 15,000 students have been indentified for services during the 2006-2007 and 2007-2008 school years. According to the data the most often cited reasons for referral included the following:^b

- Excessive absences (28% of referrals)
- Health concerns (28% of referrals)
- Inappropriate behavior (25% of referrals)
- Mental health concerns (22% of referrals)
- Held back to repeat a grade one or more years (20% of referrals)

Once a student comes to the attention of the nurse-social worker team, an assessment of his or her status in school is conducted to ascertain whether or not the student is at-risk, and CFST services are appropriate. This often includes conducting a review of appropriate school records as well as interviewing teachers, administrators, and students (as appropriate for age and the situation).

If the student is judged to be at-risk and not receiving appropriate services, the CFST team makes contact with his or her family or caretakers to explain their services and offer assistance. In some cases, the situation is resolved through actions resulting from this initial conversation. It may be that the student's need is quickly resolved by making a referral to services already present in the school, such as to a psychological assessment or to the Exceptional Children's Program. The student's need could also be readily accessed in the community, such as help with getting glasses or a prescription filled. In other cases, however, this process involves working with the family to conduct

b The numbers total to more than 100% because respondents may report more than one reason.

an in-depth assessment and assemble a Child and Family Support Team to help identify and meet the student's or family's needs. The services identified by the teams and listed on the service plans include the following:

- Medical/physician services (18.5% of the time)
- Support for parents (12.2% of the time)
- Referrals to "other community agencies" (10.9% of the time)
- Counseling services (10.6% of the time)

The primary responsibility of the nurse-social worker teams is to lead the Child and Family Support Teams and to participate in CFST meetings when other designated agencies have assumed the lead role in service provision. Child and Family Support Teams include family members and their community supports who come together to create, implement, and update a plan to meet the needs of the child. The plan builds on the strengths of the child, youth, and family and addresses their needs, desires, and dreams. The Child and Family Support Teams are centered on the families and include their natural supports and representatives from social services, mental health, the courts, public health, and other child-serving agencies to identify and plan services.

This is not the historically accepted role for school nurses or social workers. CFST nurse-social worker teams work in one school and are better able to establish trusting relationships with students, families, and stakeholders. They are expected to work as teams, meeting both the social and health needs of students using their individual professional expertise. Students and families have a prominent role in CFST meetings, and no plan can be implemented without their participation. CFST meetings occur at times and places convenient to the family. CFST meetings commonly occur off the school campus and outside school hours. Since the needs of families do not go away during the summer, each school system is responsible for

devising methods to ensure that families' needs are met throughout the year. Teams are also required to record data for the legislatively mandated evaluation.

Duke University's Center for Child and Family Policy is providing the contracted evaluation. The evaluation follows the participatory action research model and involves all stakeholders actively collaborating to address the specific issues identified by state and local practitioners, then applies the results directly to the identified problems. Outcomes are tracked through various sources of data including agency administrative data (educational, social services, and juvenile justice), surveys, and information entered into a web-based case management system developed by the evaluators for the CFST. Questions and issues that the evaluation addresses include the following:

- A description of the youth who are served by Child and Family Support Teams (grade, gender, referring problem, services received).
- A comparison of educational outcomes for schools that did and did not participate in the Child and Family Support Team process.
- An examination of changes in educational outcomes and out-of-home placements for youth before and after they entered the Child and Family Support Team process.
- An examination of the effects of the program on (a) students' access to health care, mental health care, and social services; (b) student, teacher, parent, school administrator, local agency perceptions of the CFST process; and (c) interagency collaboration in the community.

The ultimate result of these school-based CFST services is that healthy, stable students will be able to develop a mastery of core academic skills, will be better prepared for the demands of higher education and skilled work in the 21st century, and will achieve economic and personal independence. **NCMJ**

REFERENCES

- 1 National Association of School Nurses. School nursing profession to celebrate 100 years of children care [press release]. <http://www.nasn.org/Portals/0/releases/100yearkickoff.pdf>. Accessed October 7, 2008.
- 2 Allen G. The impact of elementary school nurses on student attendance. *J Sch Nurs*. 2003;19(4):225-231.
- 3 Council on School Health. Role of the school nurse in providing school health services. *Pediatrics*. 2008;121(5):1052-1056.

Information and Support
Within Your Reach

1-800-367-2229

NC Family Health Resource Line

NC Child Care Health and Safety Resource Center
Services in English and Spanish
Monday - Friday, 8 am - 5 pm (closed on holidays)
TTY for the hearing impaired: 1-800-976-1922

The Role of the Primary Care Physician in School Health: The Wayne County Experience

Dave Tayloe Jr., MD, FAAP

In 1997, Sissy Lee-Elmore, director of Community Outreach for Wayne Memorial Hospital, received a call from The Duke Endowment asking Wayne Memorial to accept funding to establish two school-based health centers in the Wayne County Public Schools. This opportunity arose because Wayne County had the 9th most uninsured school-aged children in North Carolina. The Duke Endowment chose to address the problem of the uninsured school-aged child by partnering with hospitals to make comprehensive primary health care services available in the schools. Ms. Lee-Elmore called me, senior partner of Goldsboro Pediatrics, to discuss this opportunity since the hospital was not interested in promoting school-based health centers if the only pediatric practice in the county was opposed to the concept.

My background as a community pediatrician and former member of both the Goldsboro City Schools' Board of Education (1983-1991) and the merger board that consolidated the Goldsboro and Wayne County Schools (1991-1992) had taught me the value of a good school health program. Most pediatricians enter practice with the notion that all infants, children, and adolescents will be brought to their offices for comprehensive health services according to the schedule for health supervision recommended by the American Academy of Pediatrics. My practice experience taught me that children do not choose their parents or their special needs and that some parents make the effort to bring their children in for all recommended health services, and other parents, for a variety of reasons, do not come to a doctor's office unless the child is really sick or in need of the doctor's signature on a form to enter some school, community, or summer camp program. As a member of the Board of Education, I learned firsthand the value of user-friendly school-based health services.

In the mid-1980s, the School Board was faced with a serious adolescent pregnancy problem in a local high school. The Board invited a young, energetic, enthusiastic, and culturally-effective health educator to leave the Wayne County Health Department and work full-time in the schools to address the adolescent pregnancy issue. The associate superintendent and I were the supervisors for the health educator, making sure that the program was abstinence-based and did not conflict with state law. The Board learned that if the health educator promoted abstinence as the best way to prevent complications of adolescent sexuality,

“My practice experience taught me that...some parents make the effort to bring their children in for all recommended health services and other parents, for a variety of reasons, do not come to a doctor's office unless the child is really sick or in need of the doctor's signature...”

this on-site health professional and friend of the students could teach classes on sexuality, answer students' questions about sexuality, and refer students to the Health Department or to a community physician for necessary health services including contraception, prenatal care, treatment of sexually transmitted infections, or even to discuss abortion. The schools partnered with the Wayne Action Group for Economic Solvency to place a daycare center across the street from the high school so that student mothers could attend school as many days as possible, thus preventing drop-out. In just a year or so from the start of this program, pregnancy rates at the high school were cut in half.

Dave Tayloe Jr., MD, FAAP, is a chairperson of the WISH Board of Directors and medical director of the WISH Program. He can be reached at dtayloe@goldsboroped.com.

I had become a convert to the idea that pediatricians must include the concept of the medical home in schools so that all children have access to the comprehensive health services they might need at any given point during their growth and development.

I also knew that in spite of pediatricians' willingness to provide office-based health services for school-aged children, 80% of pediatricians' time was consumed by caring for babies and preschool children. For a variety of psychosocial and economic reasons, school-aged children do not often come to pediatricians for regular health supervision visits. I also knew that many of the really expensive and tragic outcomes in childhood (juvenile crime, substance abuse including tobacco, adolescent pregnancy, sexually transmitted infections including HIV, obesity, type 2 diabetes, school failure, school drop-out, serious mental health disorders, suicide, homicide, and uncontrolled asthma) could only be addressed by offering school-aged children user-friendly comprehensive health services. So when the hospital called, I immediately committed Goldsboro Pediatrics to supporting the hospital in bringing school-based health centers to the Wayne County Public Schools.

With support and interest from The Duke Endowment, the hospital accepted the challenge of organizing a planning team that consisted of school, hospital, medical, and community partners to develop a proposal for establishing school-based health centers in two schools. This group also determined what resources various community agencies could commit to establishing and sustaining the program. A written proposal was submitted to The Duke Endowment and the Robert Wood Johnson Foundation. In meeting the requirements for funding by the Robert Wood Johnson Foundation (\$492,000 for the first three years of the program), the Wayne Initiative for School Health (WISH) Program was established as a 501(c)(3) nonprofit corporation. The WISH Board initially included the CEO of Wayne Memorial Hospital, the director of the Wayne County Department of Public Health, the director of the Wayne County Department of Social Services, the clinical director of the Wayne County Mental Health Center, a member of the Wayne County Board of Education, the director of the Communities in Schools Program, and myself, president of Goldsboro Pediatrics. I agreed to serve as chairperson of the Board and medical director of WISH. The Board chose to place the first centers in two middle schools, one in Goldsboro and one in the southern part of the county. Middle schools were selected because of the special needs of the early adolescent population and the fact that many early adolescents do not receive comprehensive health services in physicians' offices. Sissy Lee-Elmore served as the director of the WISH Program until the WISH Board hired Phyllis Hill, RN, to be the director of the program.

The hospital agreed to allow the employees of WISH to become hospital employees, so that the employees would have affordable benefits such as health insurance. The WISH Program sends money to the hospital to cover the salaries and benefits of the employees. The hospital provides salary and benefits for the director of the WISH Program, and I, as an extension of the hospital administration, serve as the director's "department supervisor," filling out a complete hospital

employee evaluation instrument on the director every year. The hospital also provides in-kind accounting services for the WISH Program. As a requirement linked to Robert Wood Johnson Foundation funding, WISH became the first school-based health center program in North Carolina to bill for services. WISH reimbursement comes from Medicaid, NC Health Choice (SCHIP), and self-pay. WISH is working with private insurance companies to obtain reimbursement for services rendered by mid-level practitioners in the centers. WISH has never pursued collection of unpaid private balances of the students enrolled in WISH. The program generates about \$20,000 in revenue from each center during a given year. The cost of operating a center (not including in-kind services and equipment) is about \$125,000 per year.

The Wayne County Mental Health Center agreed to provide on-site mental health services in the WISH centers for students identified by the WISH staff as having significant mental health problems. As the state mental health system has evolved, private sector mental health professionals now provide on-site mental health services for WISH. Currently, all six WISH Centers have mental health professionals on-site for an average of 16-36 hours per week per center.

The Health Department agreed to provide a registered dietitian to make nutritional information and medical nutrition services available to students. Currently, this commitment means that two registered dietitians provide a total of 16 hours of services a week for WISH.

The Department of Social Services provides an on-site eligibility specialist for the WISH Program so that as many students as possible can have Medicaid or Health Choice benefits. WISH staff calls upon the eligibility specialist as needed.

Wayne County Public Schools agreed to provide the WISH centers with space (1,600-2,000 square feet per center), including the cost of construction and remodeling, in-kind maintenance, and utilities. The WISH Program pays its own phone bills and provides furniture and equipment for the centers.

Goldsboro Pediatrics provides medical supervision and on-call medical consultations for the mid-level providers. The practice also provides students enrolled in WISH with access to a physician seven days a week, 24 hours a day, and gives each center the funding necessary to purchase laboratory equipment and supplies. Currently, the electronic health record system of Goldsboro Pediatrics is installed in each WISH Center to prevent duplication of services and to assure continuity of care for complicated patients who receive services in the centers and in the practice. Goldsboro Pediatrics is the only pediatric practice in Wayne County and operates four offices in the Wayne County area.

Thanks to the tireless efforts of Phyllis Hill, RN, and her staff, WISH has been able to maintain funding for the program through private foundations, state and local government, in-kind donations, and revenues generated by the provision of direct patient services. We have expanded the program to include four middle schools and two high schools, so that students enrolled in WISH in the 5th grade can be followed through high school graduation by WISH staff. Each WISH center has a half-time

mid-level practitioner (20 hours per week), a full-time nurse, and clerical staff three to four days a week. The staff coordinate mental health, nutrition, and health education services offered to the enrollees in WISH. Approximately 86% of the children who attend the WISH schools are enrolled in WISH.

WISH has partnered with the hospital's WATCH (Wayne Action Team for Community Health) program and through the mentorship opportunities of the Pediatric Leadership Alliance of the American Academy of Pediatrics has established a health education program that currently is funded by the Wayne County Public Schools so there is a full-time, culturally-effective health educator at Goldsboro High School. She works with the WISH staff to ensure at-risk students have access to good health information.

Goldsboro Pediatrics has partnered with the Wayne County Public Schools to obtain state funding for six Child Family Support Teams (CFST) comprised of nurses and social workers, and three of those teams work in elementary schools that feed the WISH schools.

Goldsboro Pediatrics, through a grant from the Community Access to Child Health Program (CATCH) of the American Academy of Pediatrics, is currently implementing a mental health initiative in collaboration with one CFST at one elementary school to address the psychosocial needs of at-risk elementary school students.

In the early 1990s, Goldsboro Pediatrics established the Wayne Pediatric Continuing Medical Education (CME) Series in collaboration with the Brody School of Medicine at East Carolina University in Greenville, North Carolina. The practice

facilitates Category I Physician CME sessions most Tuesday mornings at 7:00 am in the private dining area of the hospital cafeteria. The hospital provides breakfast for attendees, and I schedule the topics and facilitators and fill out the necessary CME forms, with assistance from Goldsboro Pediatrics and hospital staff. WISH staff and other community partners often attend these sessions that are designed to improve the quality of child health services in the community and to assure that all community agencies are collaborating in addressing the holistic health and human services needs of our children and their families.

As I reflect on my years of school health involvement, I conclude that I really have not spent that much time away from my practice working on all these projects, although serving on the school board required a significant after 5:00 pm meeting commitment. I do meet with the board of the WISH Program once a month for lunch, but these meetings occur during my regular lunch hour across the street from our main office in the private dining area of the hospital cafeteria. The WISH director comes to my office as needed so I can sign contracts and checks for WISH, and I communicate with the director and staff through phone and email. I assist the director with hiring key WISH personnel and in meeting with funders. But I have never cancelled patient appointments to meet my obligations as medical director of WISH. **NCMJ**

The author wishes to acknowledge the assistance of Phyllis Hill, RN, director of the WISH Program, and Sudie Davis, executive director of Wayne County Communities in Schools and secretary of the WISH Program for their contributions to this commentary.

Why some people think
Walt Whitman
makes chocolate candy.

Art. Ask for More.
AMERICANSFORTHEARTS.ORG

Kids don't get enough art these days. Which is why some might mistake America's most revolutionary poet for a box of chocolates. For Ten Simple Ways to get more art in kids' lives, visit AmericansForTheArts.org.

Ad Council AMERICANS for the ARTS NAMM Foundation

School-Based Dental Disease Prevention and Oral Health Education: Programs of the North Carolina Oral Health Section

Rebecca S. King, DDS, MPH; R. Gary Rozier, DDS, MPH

Tooth decay is the most common disease of school children and can have significantly negative impacts on them, their families, and the efficiency and effectiveness with which schools can meet their educational goals.¹ Close to 40% of children in North Carolina begin school already having evidence of tooth decay in their primary (baby) teeth.² Although significant advances have been made in the oral health of school children in North Carolina in the last 40 years, large disparities remain across ethnic, geographic, and income groups, particularly for very young children and particularly for access to dental care for people of all ages. Treatment can be expensive, especially for families with modest incomes and without any dental insurance.

National estimates suggest that as many as 51 million school hours are lost annually because of dental-related illnesses.³ In North Carolina, about 19% of parents of children in grades K-3 report that their child missed preschool or school at some point because of dental problems or dental treatments.⁴ Poor oral health among children in our state seems to exacerbate the substantial impact of poor general health on school performance.⁵

For almost a century, the school-based dental program administered by the state dental public health program, now known as the Oral Health Section (OHS) of the Division of Public Health in the North Carolina Department of Health and Human Services, has addressed the oral health needs of

school children. The program began in 1918 at a time when dental disease was ubiquitous, access to dental care was almost nonexistent for most children, and there were no known effective public health preventive measures to help alleviate the problem. It began with the employment of six dentists who traveled from school to school with portable equipment to extract teeth for the relief of pain and infection. Clinical care of low-income children continued in the schools for almost three-quarters of a century. However, the program has maintained an emphasis on prevention from its very beginnings. In its initial years, the program focused primarily on public education regarding the importance of good oral hygiene

By the early 1980s, effective and practical public health measures had become available. Many of these advances were the result of the National Caries Program established by the US Congress and undertaken by the National Institutes of Health (NIH) to target the dental caries (tooth decay) epidemic.⁶ The program pioneered the development and dissemination of many school-based initiatives, including fluoridation of school drinking water, fluoride mouthrinse, fluoride supplements, and the placement of dental sealants.⁷ Some of these NIH studies were conducted in North Carolina and thus proven school-based interventions rapidly found their way into dental public health practice across the state.^{8,9}

“In North Carolina, about 19% of parents of children in grades K-3 report that their child missed preschool or school at some point because of dental problems or dental treatments. Poor oral health among children in our state seems to exacerbate the substantial impact of poor general health on school performance.”

Rebecca S. King, DDS, MPH, is section chief of the Oral Health Section, Division of Public Health, NC Department of Health and Human Services. She can be reached at rebecca.king@ncmail.net.

R. Gary Rozier, DDS, MPH, is a professor in the Department of Health Policy and Management, Gillings School of Global Public Health, University of North Carolina at Chapel Hill.

This paper will review the school-based program, funded predominantly through state appropriations, that operates in 93 North Carolina counties. Although not included in estimates for the number of children affected by this program, a number of counties also provide varying levels of school-based services similar to those discussed, helping to provide more coverage for the state's school children. The OHS program is organized into four broad components described below. The OHS also maintains a Dental Public Health Residency program accredited by the American Dental Association. This paper does not discuss other programs administered by the OHS that operate outside of the school program, such as water fluoridation, which reaches 88% of North Carolinians served by municipal water supplies or educational programs for adults.

Current Goals of the Program

In 1990 the OHS chose to shift its long-standing focus on prevention and clinical care to prevention and education alone. This decision was made in part because of the increasing scientific evidence for effective and efficient programs that could be easily implemented in the school setting, the increasing technologic sophistication of dentistry that could not be met using portable equipment in school settings, and the knowledge informed by epidemiologic surveys that the small number of public health dentists deployed in public schools by the OHS could have only a limited impact on the overall unmet dental needs among school children.

The OHS seeks to eliminate disparities in oral health by using best practices as defined by the Centers for Disease Control and Prevention (CDC) and the Association of State and Territorial Dental Directors (ASTDD).¹⁰ The goals of the school-based program are exemplified in North Carolina's Healthy Carolinians 2010 Oral Health Objectives and include the following:

- Reduce total tooth decay (filled and unfilled) in preschool children
- Increase the proportion of 5th grade students whose permanent teeth are free of decay
- Increase the proportion of children younger than 19 years of age at or below 200% of the Federal Poverty Level who received any preventive dental service during the past year

Program Resources and Activities

Programs of the OHS are implemented by a staff of 73, including six public health dentists, 54 public health dental hygienists (see Map 1), health educators, and support personnel, most of whom reside in the communities they serve working in cooperation with local health departments. Close to 75% of the staff are public health dental hygienists providing community- and school-based services. They spend the majority of their time working in elementary schools. The OHS annually serves more than 300,000 children in its school-based program.

Health Education and Health Promotion

The program presents dental health information related to disease prevention, oral hygiene practices, nutrition, tobacco use, professional dental care practices, injury prevention, and consumerism to more than 144,000 school children each year. Dental health exhibits covering a variety of topics are used by dental public health staff for school and community promotions. Health promotion and educational materials are available on the OHS website at www.oralhealth.ncdhdhs.gov.

Dental Caries Prevention: Dental Sealants and Fluoride Mouthrinse

Dental sealants are clear or opaque plastic coatings applied to the chewing surfaces of teeth to prevent decay. They provide a physical barrier that prevents debris and decay-causing bacteria from collecting in the pits and fissures of vulnerable teeth. About 90% of all dental caries in permanent teeth of school children occurs in pits and fissures, providing a strong justification for sealant use.¹¹ A systematic review by the US Task Force on Community Preventive Services found strong evidence that school sealant programs are effective in reducing incidence of caries by 60% on the chewing surfaces of posterior teeth where most pit and fissure decay occurs. Based on these findings, the Task Force recommended that school sealant programs be part of a comprehensive community strategy to prevent dental caries.¹²

The OHS promotes the use of dental sealants through dental health education, health promotion, and direct clinical services. Teams of dentists and hygienists provide sealants for children in high-risk schools using portable dental equipment. Almost 2,700 children who otherwise have limited access to dental care received sealants in 2007-2008. School-based dental sealant programs also are highly effective when combined with fluoride and referral programs.

Except for a period in 2002-2004, the OHS has operated a school-based weekly fluoride mouthrinse program for elementary school children since the mid-1970s. According to systematic reviews completed by the Cochrane Collaboration, strong and consistent evidence suggests that this school-based intervention reduces tooth decay by about 26%.¹³ The fluoride mouthrinse program also is an efficient use of resources because all children in a classroom rinse simultaneously under the supervision of teachers or trained volunteers, and only a few inexpensive supplies are needed to implement the program.

The fluoride mouthrinse program was discontinued in 2002 because of budget constraints; but faced with growing disparities in oral health, the 2006 North Carolina Legislature appropriated funds to reestablish this preventive dentistry program and expanded its funding in 2008. Plans are underway to provide this program annually to more than 85,000 school children at high risk for tooth decay. Children in high risk schools, which include those not drinking fluoridated water and those that have a large number of students enrolled in the free and reduced lunch program, rinse in the classroom with 10 ml of 0.2% NaF (9.0 mg F) once a week.

Map 1.
OHS Public Health Dentists and Dental Hygienists



Oral Health Status Assessments

Surveillance is one of the core functions of public health.¹⁴ The ASTDD recommends that every state “establish and maintain a state-based oral health surveillance system for ongoing monitoring, timely communication of findings, and the use of data to initiate and evaluate interventions.”¹⁵ North Carolina has one of the most comprehensive oral health surveillance systems in the nation. It includes infrequent but comprehensive clinical surveys of probability samples of the North Carolina population of all ages or school children in all grades.² These surveys have been conducted in 1960-1962, 1976-1977, 1986-1987, and 2003-2004 with external grant funding.

The surveillance system also includes annual oral health status screenings of virtually all children in grades K and 5 statewide. Starting with the 1996-1997 school year, dental assessments carried out by trained and calibrated dental public health staff have provided standardized annual surveillance information on oral health. Resulting information is an essential tool for community diagnosis and vital for effective program planning, implementation, and evaluation. These assessments provide county decision makers with data to establish a reliable index to track dental disease levels over time and to compare data with other counties.

Results of the surveillance system demonstrate tremendous progress for children once they are in school. According to the 2007-2008 surveillance results, only 25% of children have experienced any caries in their permanent dentitions by the time they are in the 5th grade, 4% have untreated decay, and 42% have dental sealants. Surveillance also demonstrates the progress needed to achieve the OHS’s goals for preschool children. Close to 40% of kindergarten students had a history of caries experience in their primary dentitions in 2007-2008. However, surveillance system data also point out significant geographical disparities. For example, kindergarten children in Duplin and Robeson counties, separated by only one or two counties from New

Hanover County, have more than twice the caries rate, 63% and 61%, respectively, compared to 29% in New Hanover.

Access To Dental Care

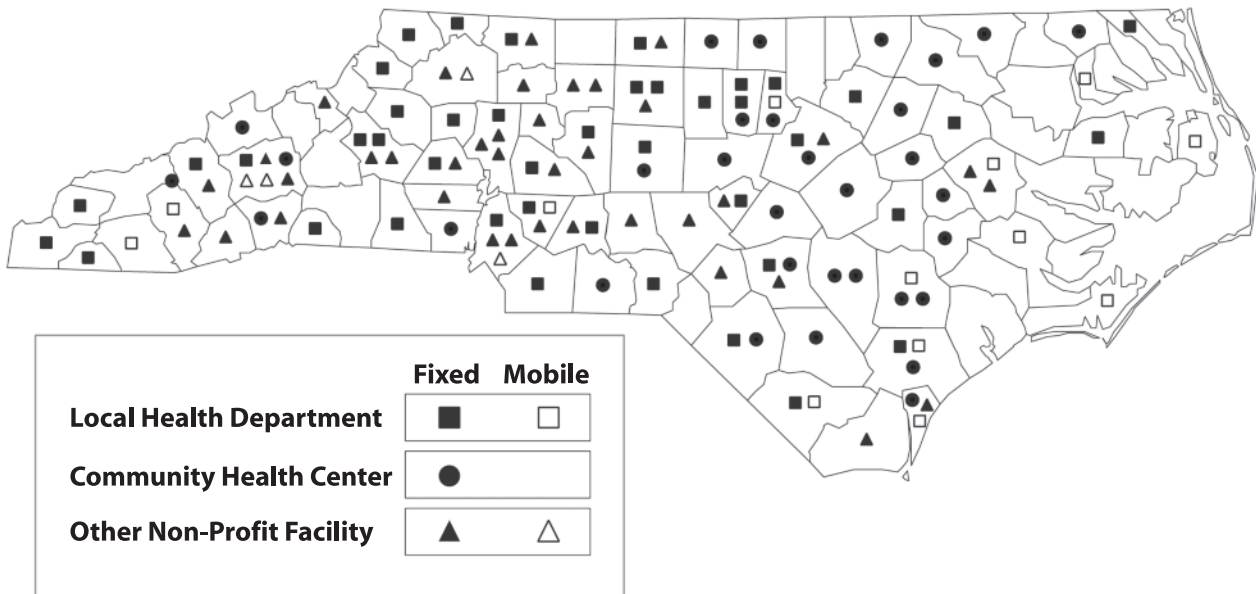
Lack of access to appropriate dental prevention and treatment services among the medically indigent is a significant problem. Current low reimbursement rates in third-party programs need to be further increased to improve participation from the private sector. An analysis of the experience of six states showed that reimbursement rate increases can have a substantial effect on dentist participation in Medicaid and access to care for children.¹⁶ Safety-net dental clinics have been established across the state to address this underserved population (see Map 2). These clinics are a result of the collaborative efforts of the OHS, local health departments, community organizations, and grant providers.

One purpose of the surveillance system is to provide for the early detection of untreated disease. Dental hygienists in the school-based program provide follow-up and referral to local providers for children identified during assessments as being in need of dental care. In the 2007-2008 school year, almost 190,000 children were screened, and more than 32,700 were found to be in need of dental care. OHS staff, working with school nurses, were able to find dental care for more than 12,400 or 38% of those in need. Assessment, referral, and follow-up activities are targeted primarily toward children in kindergarten and 5th grade. Based on the needs and resources of an individual county, elementary school children in selected grades other than kindergarten and grade 5 may be screened for tooth decay.

Challenges and Future Directions

Dental caries begin at a very early age for high-risk children and progress rapidly so that many, as evidenced by the surveillance results, have extensive disease by the time they

**Map 2.
Dental Care Safety Net Facilities, April 2008**



enroll in school. One of the biggest challenges facing dentistry is the increase in the prevalence of dental caries, also known as early childhood caries (ECC), in the preschool-aged population, both nationally and in North Carolina.^{2,17} This trend is particularly striking for children in low-income families. The OHS has recently increased its emphasis on the prevention of ECC in preschool-aged children at high risk for tooth decay who are contributing, in part, to an increasing strain on our ability in North Carolina to address the needs of elementary school children.

The OHS provides training and support for physicians and local health departments for the statewide Medicaid program known as Into the Mouths of Babes. This program reimburses these non-dental primary health care providers for preventive dental services (oral health education for the caregiver and dental screening and fluoride varnish application for the child) provided for children younger than three and a half years of age. The program is designed to prevent as much disease as possible so that children start school in North Carolina healthier and better able to learn. In 2007, eligible children had more than 100,000 preventive dental visits at their physicians' offices or public health clinics.

An Early Childhood Oral Health Collaborative (ECOHC) is also working to help ensure that children start school with as little history of dental disease as possible. One project administered by the OHS is known as the Carolina Dental Home, which is designed to facilitate the referral of young children from medical offices to dental offices. Plans also are underway through another project administered by the OHS to extend this program statewide by development of evidence-based guidelines that physicians can use to refer young children to the dentist. These projects are developing models for oral health care systems in communities across the state that will improve access to preventive and treatment services for the preschool child.

As in other public health programs, the increasing North Carolina population and its growing diversity are placing a strain on school-based preventive dentistry programs. The largest percentage growth for any age category of the North Carolina population is in the youngest ages. From 2001 to 2005, Hispanic students accounted for 57% of total growth in North Carolina public schools.¹⁸ These children are at high-risk for tooth decay. The sociodemographic changes in society are leading to major geographic disparities in oral health status of school children.

The OHS currently has an average of one public health dental hygienist for every 13,800 elementary school children. This population estimate for hygienists' responsibilities does not include preschool children and the larger community in the geographic area of responsibility for dental hygienists. Additional public health dental hygienists are needed to expand prevention and education services into the preschool population and to implement a more comprehensive program in the growing number of high-risk schools and counties. The goal of the OHS is to improve the ratio of public health dental hygienist to elementary school children to 1:7,000 plus the community and preschool population in their area of coverage.

Healthy children grow up to be healthy and more productive adults. Working in North Carolina's schools, the state-funded OHS program has made tremendous strides in improving the oral health status of the state's children. Innovative programs for the preschool population have brought in new partners from the medical community, which have dramatically increased access to preventive dental services, particularly for those who need them the most. With adequate resources (dental public health staff, funding for preventive services, and increased Medicaid dental reimbursement) North Carolina can provide proven, effective preventive services for more of its children. **NCMJ**



REFERENCES

- 1 US Department of Health and Human Services. *Oral Health in America: A Report of the Surgeon General*. Rockville, MD: US Dept of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health; 2000.
- 2 Rozier RG, King RS. Defining the need for dental care in North Carolina: contributions of public health surveillance of dental diseases and conditions. *NC Med J*. 2005;66(6):438-444.
- 3 Gift HC, Reisine ST, Larach DC. The social impact of dental problems and visits. *Am J Public Health*. 1992;82(12):1663-1668.
- 4 Rozier RG, King RS. *North Carolina School Oral Health Survey, 2003-04*. Raleigh, NC: North Carolina Dept of Health and Human Services, Oral Health Section; 2006.
- 5 Blumenshine SL, Vann WF Jr, Gizlice Z, Lee JY. Children's school performance: impact of general and oral health. *J Public Health Dent*. 2008;58(2):82-87.
- 6 Horowitz HS. The halcyon days of clinical field studies of dental caries prevention, 1960-1980. *J Dent Res*. 1998;77(6):1380-1383.
- 7 Horowitz AM, Thomas HB, eds. *Dental Caries Prevention in Public Health Programs*. Bethesda, MD: National Institutes of Health; 1981. NIH Pub No. 81-2235.
- 8 Driscoll WS, Heifetz SB, Korts DC. Effect of chewable fluoride tablets on dental caries in schoolchildren: results after six years of use. *J Am Dent Assoc*. 1978;9(5):820-824.
- 9 Heifetz SB, Horowitz HS, Brunelle JA. Effect of school water fluoridation on dental caries: results in Seagrove, NC, after 12 years. *J Am Dent Assoc*. 1983;106(3):334-337.
- 10 American Association of State and Territorial Dental Directors and Centers for Disease Control and Prevention. Proven and promising best practices approaches for state and community oral health programs. Association of State and Territorial Dental Directors website. <http://www.astdd.org/index.php?template=bestpractices.html>. Accessed October 8, 2008.
- 11 Macek MD, Beltran-Aguilar ED, Lockwood SA, Malvitz DM. Updated comparison of the caries susceptibility of various morphological types of permanent teeth. *J Public Health Dent*. 2003;63(3):174-182.
- 12 Truman BI, Gooch BF, Sulemana I, et al. Reviews of evidence on interventions to prevent dental caries, oral and pharyngeal cancers, and sports-related craniofacial injuries. *Am J Prev Med*. 2002;23(1 suppl):21-54.
- 13 Marinho VC. Evidence-based effectiveness of topical fluorides. *Adv Dent Res*. 2008;20(1):3-7.
- 14 Institute of Medicine of the National Academies. *The Future of Public Health*. Washington, DC: National Academy Press; 1988.
- 15 American Association of State and Territorial Dental Directors. Building infrastructure and capacity in state and territorial oral health programs. <http://www.astdd.org/docs/Infrastructure.pdf>. Published April 2000. Accessed October 8, 2008.
- 16 Borchgrevink A, Snyder A, Gehshan S. The effects of Medicaid reimbursement rates on access to dental care. National Academy of State Health Policy website. http://www.nashp.org/Files/CHCF_dental_rates.pdf. Accessed October 15, 2008.
- 17 Dye BA, Tan S, Smith V, Lewis BG, Barker LK, Thornton-Evans G, et al. Trends in oral health status: United States, 1988-1994 and 1999-2004. *Vital Health Stat 11*. 2007;(248):1-92.
- 18 Kasarada JD, Johnson JH Jr. *The Economic Impact of the Hispanic Population on the State of North Carolina*. Chapel Hill, NC: The University of North Carolina at Chapel Hill, Kenan-Flagler Business School; 2006.

**THAT'S SO
"JOCK
WHO CAN
COMPLETE
A PASS
BUT NOT A
SENTENCE."**

Think that's mean? How do you think "that's so gay" sounds? Hurtful. So, knock it off.

ThinkB4YouSpeak.com

The Case for a Comprehensive, Effective, and Realistic Anti-Bullying Policy in North Carolina's Schools

Representative Rick Glazier, JD

North Carolinians can be rightly proud of a tradition of excellence in public schools. Yet in one of its most fundamental tasks, our state's education system is failing. Despite a constitutional right to a sound, basic education that is guarded and protected by the state, policies currently in place to protect our children from bullying, harassment, and other forms of violence in schools have proven insufficient and ineffective. Efforts to modify policies at the local level to address this issue have encountered mixed results, though school districts that have adopted clear policies with enumerated protections for the most likely victims have been effective in reducing the number of incidents of bullying and engendering safer environments for their students to learn and succeed.¹ It is within this context, and with a dedication to providing a safe, healthy, and protective environment for every student in our state, that any effort to address these issues honestly and effectively must be undertaken.

In early 2007, a piece of legislation was introduced in the North Carolina legislature with a clear purpose: reducing the incidence of all types of violence within our public education system. HB1366, titled the School Violence Prevention Act, initially enjoyed bipartisan support and sponsorship, was recommended for passage by the House Education and Judiciary I committees, and was passed by the House of Representatives in its original form less than two months after it was introduced. Its passage was hailed as a victory by a coalition of advocates and organizations representing North Carolina's teachers; school social workers and school psychiatrists; disability advocates; lesbian, gay, bisexual, and transgender (LGBT) rights groups; the North Carolina Council of Churches; the Covenant with North Carolina's Children; Parents and Teachers Against Violence in Education; and many others.

Despite this achievement, the North Carolina General Assembly adjourned the 2007-2008 session without completing

the important task of passing HB1366, a deeply unfortunate result of controversy surrounding the bill that reflected neither its true intent nor the realities faced by far too many of the students in our state's public schools. While the failure of the legislature to pass an anti-bullying and school violence bill was celebrated by some conservative advocates, many children in our schools continue to suffer abuse, harassment, and an environment

“Despite a constitutional right to a sound, basic education that is guarded and protected by the state, policies currently in place to protect our children from bullying, harassment, and other forms of violence in schools have proven insufficient and ineffective.”

of fear and hostility, often too afraid to report acts of violence and unconvinced that any action will be taken if they do speak out. As has been made all too clear in recent years by deadly school shootings throughout the United States, victims of sustained violence in schools are beginning to react in terrible and bloody fashion, resorting to violence not only against their tormentors, but against innocent classmates, teachers, and often themselves. What we have learned from these tragedies must be employed to address all types of school violence in our own state.

In North Carolina, the “Policy for anti-harassment, bullying, and discrimination” was adopted in 2004 by the State Board of Education (SBOE). Like many policies in the United States, it directs each local school board to adopt “policies and procedures to prevent, intervene, investigate, document, and report all

Rick Glazier, JD, represents the 45th District in the North Carolina House of Representatives. He can be reached at rickg@ncleg.net or through his website, www.rickglazier.com.

forms of harassment, bullying, and discrimination.”² The policy also requires each local board of education to adopt policies prohibiting retaliation against those reporting incidents and to report all incidents to the SBOE. The policy does not, however, define bullying, harassment, or discrimination, nor does it enumerate protected categories of students who are most likely to be victims of bullying. Any reasoned analysis of this policy reveals it is incomplete and woefully ineffective. A new, comprehensive policy is needed.

North Carolina’s SBOE policy SS-A-007 is part of the policy priority Healthy Students in Safe, Orderly, and Caring Schools, yet research reveals many students find public school neither safe nor caring. A study of school climate in North Carolina found only one-third of students considered their schools to be very safe, and nearly one half considered bullying and harassment to be somewhat serious or very serious problems in their schools.¹ This is consistent with national-level data, which showed that 55% of 8-11 year-olds and 68% of 12-15 year-olds thought bullying was a major problem in their schools—more so than alcohol, drugs, AIDS, racism, or pressure to have sex.³ The effects of bullying on victims are well-documented: victims are more likely to suffer from anxiety, low self-confidence, and depression in adulthood.⁴ The effects on the bullies themselves are also detrimental: bullies are more likely to drink, smoke, and get poor grades.³ Further, one study found that 60% of children identified as bullies had at least one criminal conviction by the age of 24.⁴ Those who witness bullying are also affected, with many suffering from fear of reprisal should they intervene or report the incident; thus, many students may indirectly encourage the behavior out of this fear.³

Despite the seriousness of the bullying issue, students often find their reports of bullying to be taken less than seriously by too many school staff. A national study found that 66% of bullying victims believed school officials responded poorly to the incidents they witnessed,⁵ and a 2003 study of North Carolina students found that one-quarter of students who reported bullying incidents indicated that school authorities did not take appropriate action.¹ Given this fact, it is not surprising to learn that nearly half of students in North Carolina who were bullied did not report the incident.¹ Among the reasons given for not reporting incidents, students listed fearing they would not be believed and having no confidence that anything would change as a result.⁵

Students who are bullied in schools and feel they cannot rely on their school officials for support develop their own methods of dealing with their situation. One method for avoiding bullying and the related anxiety is to simply avoid school altogether. Studies have found that 160,000 or 10% of students skip school each year to avoid bullying and another 29% had considered doing so.^{3,4} Victims of bullying are also more likely to drop out of school entirely. Additionally, a more extreme and desperate means of escaping bullying is dishearteningly common: victims of bullying are far more likely than their peers to commit suicide.³ According to Dan Olweus, a noted bullying researcher, victims “go through the school years in a state of more or less permanent anxiety and insecurity...it is not surprising that the victims’

devaluation of themselves becomes so overwhelming that they see suicide as the only possible solution.”⁵

While suicide may seem to be the most extreme and tragic consequence of bullying behavior, there is in fact a far more devastating trend. In a study of fatal school shootings, the United States Secret Service National Threat Assessment Center found that nearly 75% of attackers felt persecuted, bullied, or injured by others prior to the attack.⁶ Another study found that two-thirds of school shooting perpetrators were long-time victims of bullying, persecution, and violence by peers. This includes the perpetrators of the Columbine school massacre in which 15 people died, including the students who carried out the attack.⁷ Additionally, Seung-Hui Cho, the perpetrator of the 2007 Virginia Tech massacre in which 33 people died, was reportedly bullied and harassed in high school.⁷ These tragedies represent the most extreme and deadly kind of school violence and were caused in part by another kind of school violence, one that is preventable and unacceptable.

One of the central realities that must be addressed honestly and directly when confronting the issue of violence in schools is this: some students are more likely than their peers to be targeted. Though all cases of bullying and harassment are individual and all acts of schools violence are equally unacceptable, research indicates characteristics that distinguish certain students, whether real or perceived, are indicators of a heightened risk for bullying, harassment, and more extreme forms of violence. Unfortunately, some of the characteristics that distinguish potential victims of school violence also distinguish groups that are discriminated against in society at large, making efforts to provide responsive protections more difficult. One of the most vulnerable groups is lesbian, gay, bisexual, and transgendered (LGBT) students, who are five times more likely than their peers to miss school due to fear of bullying and four times more likely to be threatened with a weapon at school.³ One in three LGBT students will be physically harassed because of their sexual orientation or gender expression, and one in six will be beaten to the point of requiring medical attention.³ LGBT students in North Carolina are subject to frequent homophobic remarks by both peers and school officials, yet 33% of students report school staff rarely or never intervene when hearing these remarks, and 43% report fellow students rarely or never intervene.¹

This atmosphere reflects an attitude that homophobic remarks are not considered bullying but instead an expression of free speech. The Family Research Council, an extremely conservative Christian advocacy group, has campaigned against any policy giving specific protection to LGBT students, claiming such policies promote homosexuality, which it considers to be a “voluntary... changeable, and... harmful” lifestyle choice.³ Indeed, some extreme groups have warned that such legislation “might lead to homosexual sensitivity training in schools.”³ In North Carolina, these marginal groups erroneously warned passage of HB1366 would represent an affirmation of homosexuality as acceptable and give LGBT students special rights that their peers do not enjoy—this despite language in the bill that strictly prohibits any special preference or legal priority for any group. That an attempt to equalize protections

for all children would be attacked as unfair, that making schools safe for all students could somehow be characterized as privilege, and that opponents could ironically champion the cause of equality while singling out a group of children as one less deserving of our protection is not only an example of the illogical arguments made against this legislation, it is a window into the underlying prejudices that were at work in this debate and in the mistreatment of the students the bill sought to protect. The fact that such vociferous opposition to inclusion of perceived or actual LGBT students in the ambit of the anti-bullying policy existed from ideological extremists opposed to its passage in itself made the case for the necessity of their inclusion in the enumerated policy better than any argument supporters could have articulated.

The central question in the debate over this bill became why a simple policy forbidding bullying in all cases is insufficient, and the answer can be found in the 24 North Carolina school districts from the mountains to the coast that have an enumerated policy in place. Students in these schools report feeling safer in school, being less likely to be bullied, and believing bullying incidents were more likely to be taken seriously by significant margins.¹ These are the uncontradicted facts, which cannot be denied by any individual or group. HB1366 is neither a special-rights bill nor the tip of a culture-war spear that many opponents fear. It is a representation of our obligation to protect all children, regardless of race, color, religion, ancestry, national origin, gender, sexual orientation, gender identity or expression, physical appearance, mental, physical, or sensory disability, or association with a person who has or is perceived to have one

or more of these characteristics. HB1366 is a compilation of the most effective polices in place in our state, and indeed our nation, a tool to empower those whose are victimized, and a clear policy that allows for equitable and consistent enforcement.

The educational system, at its best, strives to provide all children in its care with a refuge of safety and stability, and for many children it may be the only environment in their lives that can consistently provide these. If we can accept that no child should be subject to bullying or harassment, if we accept the reality that some students continue to face unrelenting harassment and physical and emotional abuse despite general policies prohibiting such behavior, we have no choice but to act. If we understand some students will be more likely victims and enforcement of our state's disparate and inequitable local policies have not proven effective, we must seek alternatives that demonstrate efficacy, equality, and empowerment for all of our students, regardless of the prejudices at work against them. If we fail to do this and even one of our students continues to be needlessly endangered, we forfeit the right to consider ourselves leaders. Sadly, the harshly prejudicial arguments of a narrow ideological group and political fear in an election year defeated this bill last session, but the legislation will be vigorously pursued for the sake of so many vulnerable children of this state again this legislative session—and I am confident it will be met with a more reasoned, compassionate, and successful result. **NCMJ**

This article was prepared with the extensive research and written assistance of Alexander C. Miller, MSW.

REFERENCES

- 1 Gay, Lesbian, and Straight Education Network, Harris Interactive Inc. *From Teasing to Torment: School Climate in America. A Survey of Students and Teachers*. New York, NY: GLSEN; 2005.
- 2 North Carolina State Board of Education. *Policy for anti-harassment, bullying, and discrimination*. North Carolina State Board of Education website. <http://sbepolicy.dpi.state.nc.us/>. Accessed September 20, 2008.
- 3 Greenya J. Bullying: are schools doing enough to stop the problem? *CQ Researcher*. 2005;15:104-124.
- 4 Clarke EA, Kiselica MS. A systematic counseling approach to the problem of bullying. *Elementary School Guidance & Counseling*. 1997;31(4):310-325.
- 5 Sampson R. *Bullying in Schools*. Washington, DC: US Dept of Justice Office of Community Oriented Policing Service; 2002. Office of Community Oriented Policing Services website. <http://www.cops.usdoj.gov>. Accessed September 20, 2008.
- 6 US Secret Service National Threat Assessment Center. *USSS Safe School Initiative: An Interim Report on the Prevention of Targeted Violence in Schools*. United States Secret Service website. http://www.secretservice.gov/ntac_ssi.shtml. Accessed September 20, 2008.
- 7 Kleinfeld NR. Before deadly rage, a life consumed by troubling silence. *The New York Times*. April 22, 2007. The New York Times website. <http://www.nytimes.com>. Accessed September 20, 2008.

Understanding the Role of Special Education in North Carolina's Public Schools

Mary N. Watson

Nearly 200,000 (approximately 13%) of the 1.4 million students enrolled in North Carolina's public and charter schools are identified as having disabilities. The disabilities may be physical, behavioral, developmental, intellectual, sensory, or a combination of these. All of these students require an individualized education program (IEP) of specialized instructional practices and materials in order to benefit fully from their education. Some also require related services such as physical, occupational, or speech therapy; assistive technology; or adapted classroom facilities or equipment. Some medically fragile students are on ventilators while others require tube feeding or catheterization in order to attend school. While the majority of students with disabilities receive special education and related services in regular classroom settings or in small resource classes, a small percentage of them receive these services in separate classes within regular schools, in separate day or residential schools, and sometimes in hospitals or in their homes.

To fully appreciate the role of special education in North Carolina's overall public education system, one must grasp the reality that more than 95% of these nearly 200,000 students go to the same public schools that their nondisabled peers attend. Nearly every general education classroom in our state includes students with disabilities. Long gone are the days when handicapped students were not sent to school at all or were turned away as unteachable, isolated in some institution or, out of a general lack of understanding of the disability were simply tolerated, having little or no chance of becoming productive, self sufficient, taxpaying citizens. North Carolina enacted its first law authorizing the provision of special education for handicapped children in 1947 and was one of the first states to do so. Now, more than 60 years later, the public schools of North Carolina provide special education services for students with disabilities beginning at age three. Younger children, those from birth through age two have the benefit of early intervention programs provided to identified infants and toddlers under the auspices of the Department of Health and Human Services.

The ever-increasing emphasis that students with disabilities are, first and foremost, students, has been clearly reflected in periodic reauthorizations of the federal special education law now known as the Individuals with Disabilities Education Improvement Act (IDEA), initially passed in 1975, and in corresponding revisions to Article 9 of Chapter 115C of the North Carolina General Statutes. These laws emphasize that students who have disabilities belong in the mainstream of education and should not be removed unless absolutely necessary and, even then, not until interventions have been tried within the general education environment and have been determined to be inadequate. Even audit and compliance monitoring functions have changed. Since the turn of the century there has been a dramatic transition in the way progress is monitored. We have moved from a rather cold compliance with the law mentality to one of continuous improvement. No longer is a "pass-fail" checklist a satisfactory result of compliance monitoring; local education agencies now focus on outcomes and plan their programs around the results of the last monitoring cycle, perhaps

“Nearly every general education classroom in our state includes students with disabilities.”

now better conceptualized as a continuous monitoring spiral. The United States Department of Education's emphasis on accountability is clear: "Efforts are important, but effect is everything."

If one visited the Exceptional Children Division on a day when all staff were present and available to talk about what they were working on, the visitor

might be overwhelmed at the passion, enthusiasm, and intensity with which our consultants shared the many successes of their work. There would be much talk about literacy and how even severely medically fragile students—such as those who are deaf-blind—are learning to read. A visitor would no doubt hear how an analysis of the results of the state's testing program confirms that the percent of students with disabilities who are reading at their grade level is increasing at twice the rate of nondisabled students. One might notice how frequently the terms "research-based" and "evidence-based" permeate many of the conversations about curriculum and instructional interventions.

Mary N. Watson is the director of the Exceptional Children Division of the North Carolina Department of Public Instruction. She can be reached at mwatson@dpi.state.nc.us.

Exceptional Children Division Vision Statement:

Exceptionally qualified consultants, working through Communities of Practice at local, state, and national levels, provide consultation and training that enable exceptional students in all local education agencies to engage and progress in a general curriculum that is founded on solid research and is relevant to the times.

It's possible that there would be more talk about school-wide Positive Behavioral Support programs, which have the potential to change the behavioral culture within an entire school, than there would be about the need for better behavioral intervention plans for individual children. Someone would surely mention that this year's graduation rate for students with disabilities is up over 7% from last year. Our occupational and physical therapists and our speech language pathologist might bend the visitor's ear with accounts of how related services personnel now participate actively in IEP team meetings and how such meetings increasingly use language that is more family-friendly and less arcane and discipline-specific.

Other consultants would be delighted to tell you of the work going on to train school resource officers in techniques of intervention designed to ease rather than escalate a child's disruptive behavior, making it especially useful in a potential crisis situation involving certain communication or behaviorally disabled students. Consultants who are aware of the American Medical Association's recommendations for screening of infants for autism at ages 18 and 24 months would be eager to tell about their work with other medical professionals on a committee that is presently engaged in designing a flow chart that will not only assist physicians in the autism screening process but also point out other "red flags" that would facilitate the early referral and diagnosis of infants who may have other disabilities as well.

There are also challenges to the effective implementation of special education services in our state. Tight budgets, which inevitably force constricted thinking by lawmakers and administrators, create a constant threat of less than adequate funding. An unwritten but clearly understood duty of every local Exceptional Children program director is to do more with less. Every little bit helps, and a critical need among local education agencies this year is for prompt physician approval of Medicaid reimbursement requests made by school officials for eligible services that are provided in public schools. Other challenges include the recruitment and retention of qualified personnel. In 2001, the Self-Assessment Steering Committee of the Departments of Public Instruction and Health and Human Services assessed the effectiveness of the state's implementation

of IDEA. The Committee's report identified personnel shortages as one of the five most pervasive problems of the state's special education system: "[T]he self-assessment documents dramatic personnel shortages in North Carolina. Higher education is not producing new teachers in sufficient quantities to keep pace with population growth and teacher turnover rates... There are nontraditional routes leading to licensure that help fill gaps but do not adequately address competency. Efforts to support and retain lateral entry teachers need to be comparable to those that support teachers who have been traditionally trained." Although seven years have passed, this problem is as true today as it was in 2001. Special education needs more trained teachers as well as more occupational and physical therapists and speech language pathologists, and all need to feel supported and valued so that they choose to stay in the profession. We are proud, however, of the significant changes that have been made in the area of teacher licensure, which now emphasizes generic competencies across all categories of exceptionality and focuses on the services teachers must deliver to students with disabilities, rather than on blind adherence to a system of categorical licensure.

As I prepared to write this commentary, I imagined myself actually standing among the 36,000 subscribers to the *North Carolina Medical Journal* engaging in friendly conversations about our common interests and acknowledging the ways we interact on behalf of the clients our professions share in common. I realized how our shared interest in early identification, diagnosis, and referral of children with disabilities has the potential for making significant differences in their educational progress, especially for those high-risk hearing impaired or autistic children whose narrow learning windows for language development must be recognized and maximized. I realized how the research into why the incidence rate for autism has increased tenfold in as many years will benefit both educators and health professionals and how often advances in the field of medicine and pharmacology have contributed to a variety of improved instructional techniques and practices. Special educators know a lot, but we also have a lot to learn. It is my hope that dialogue between medical and education professionals about children with disabilities will always be ongoing and never be taken for granted and that the Exceptional Children Division will always be on the top of the list of resources that the medical community can call on as colleagues and allies in a shared pursuit of the best health and educational opportunities for all children with disabilities. **NCMJ**

For additional information on special education programs in North Carolina, please call 919.807.3969 or go to www.ncpublicschools.org/ec.

Immunizations and the Role of North Carolina Schools

Beth Rowe-West, RN; Amy Caruso

Before the routine implementation of vaccination in the United States, thousands of children each year died or were seriously harmed by diseases that are now preventable with vaccines. North Carolina law requires children be vaccinated against 10 diseases before entering school for the first time.

North Carolina schools play a crucial role in the implementation of this law and therefore in the health of our communities. Enforcement of immunization law is in the hands of school principals and public health officials. If a public school student in North Carolina hasn't received all vaccines required for school entry, he or she faces exclusion from school. This rule, which may seem strict, ensures a vital outcome: fewer children suffer from and pass along vaccine-preventable diseases.

Communicating with Parents

Schools account for vaccination requirements by asking parents to submit a vaccination record for their children. Data for each student, classroom, and school is collected and submitted to the Immunization Branch of the North Carolina Division of Public Health, which then submits the information to the federal Centers for Disease Control and Prevention (CDC).

Schools across the state use a variety of methods to ensure parents know about vaccine requirements. Information is mailed to parents, sent home with students, and even communicated via recorded telephone messages. The North Carolina Immunization Branch develops a variety of materials to assist schools in communicating with parents.

An example of this partnership involves a recent change in state immunization law. As of January 1, 2008, state law requires a booster dose of Tdap vaccine for 6th graders and college students as well as two doses of mumps vaccine for kindergarteners. This rule was changed to address an increase in the incidence of pertussis and mumps. Forty-six cases of pertussis were reported to the state in 2002. That number jumped to over 300 cases in 2006 and 2007. Cases of mumps are also on the rise. Two cases were reported in 2002 while almost 30 cases were reported in North Carolina in 2007.

The new rule mandates that middle schools assess and, in some cases, follow up on the new requirement to assure that children are immunized this fall. Elementary schools, colleges, and universities are accustomed to tracking immunization

records for their students, but was the first time middle schools were asked to do so.

To help get the word out, the North Carolina Immunization Branch created a resource kit for schools. It included bilingual sample letters to parents, postcards, and a report card stuffer.

“If a public school student in North Carolina hasn't received all vaccines required for school entry, he or she faces exclusion from school. This rule... ensures a vital outcome: fewer children suffer from and pass along vaccine-preventable diseases.”

Sample scripts were provided for schools to use on websites, in PTA newsletters, and in media releases. The resource kit was mailed to every principal, school health nurse, and superintendent in the state. Schools were able to order additional copies of all the resources.

In many cases schools worked with their local health departments to hold vaccination clinics for their students. Some clinics were held on school campuses to accommodate students who couldn't make it to a provider.

Beth Rowe-West, RN, is head of the Immunization Branch in the North Carolina Division of Public Health. She can be reached at beth.rowe-west@ncmail.net.

Amy Caruso is a public information officer for the North Carolina Immunization Branch.

School-Based Health Centers

Vaccination clinics are not new to schools in North Carolina. In fact, many students in our state are able to take advantage of permanent school-based health centers. School-based health centers operate in a variety of ways. They may be stand-alone facilities or function as an outreach effort from the local health department. School-based health centers can be operated by school nurses, nurse practitioners, or physician assistants. Many function as a resource to parents in medically underserved areas. Some offer a variety of health care services while others only provide vaccines. In all, there are 59 school-based health centers in 23 North Carolina counties.

A Success Story: Roll Up Your Sleeves Campaign

School-based clinics were used with great success in an effort to reduce the incidence of hepatitis B in our state. North Carolina immunization law requires all children born on or after July 1, 1994, to complete the hepatitis B vaccination series. In 1995, North Carolina launched a statewide 10-year initiative to offer hepatitis B vaccinations to all 6th-graders through school-based clinics. This initiative was designed to reach children who missed the vaccination series prior to enactment of state law.

School-site immunization clinics provided a unique opportunity to vaccinate adolescents before the age of greatest risk of exposure to the hepatitis B virus. This initiative offered the best hope for completing the recommended vaccinations over a six-month period, and it was flexible and convenient for parents.

After the initiative began, the number of reported new cases of hepatitis B in North Carolina declined by 77%. The greatest reduction in cases was among the population between 0 and 19 years of age, who experienced a 91% decline. The number of cases in people 20 years of age and older saw a decline of 75%.

This initiative concluded after the 2005-2006 school year because all children entering 6th grade in the fall of 2006 were born after July 1, 1994 and had been mandated by state law to receive the hepatitis B vaccine prior to school entry.

State and Federal Law

Schools in North Carolina are bound by state and federal law in regard to immunizations. North Carolina Immunization Law is part of the state's Public Health Law. It requires that school principals ensure students have the required vaccinations or be excluded from attending school. Violation of the law is a misdemeanor.

In 1994, the North Carolina General Assembly passed Garrett's Law which requires schools in North Carolina to provide information about certain vaccine-preventable diseases to parents

and guardians. Schools must provide information about meningococcal meningitis, influenza, and human papillomavirus (HPV) at the beginning of every school year. The information must include the causes, symptoms, and transmission methods of the diseases. It must also inform parents and guardians where to obtain additional information and vaccinations for their children.

Schools comply with this law in a variety of ways. Schools may mail the information to parents, send it home with students, or contact parents and guardians via phone with recorded messages. The North Carolina Immunization Branch provides materials schools can use to comply with this law.

The federal McKinney-Vento Act created programs to provide a range of services to homeless people in the United States. The act ensures the educational rights of homeless children. It requires schools to admit homeless students regardless of whether a student has required documents, such as an immunization record. Each Local Education Agency (LEA) in North Carolina has a homeless education liaison or coordinator. The liaison arranges transportation to and from school for the student and ensures the student can take advantage of services provided to other students, such as before and after school care. The liaison also works to ensure the student gets required immunizations.

Exemptions to Immunization Law

The state allows two types of exemptions to immunization law. Schools are required to ensure their students have up-to-date vaccination records or a *bona fide* medical or religious exemption on file. Only a North Carolina licensed physician can request a medical exemption. If a doctor treats a patient with a contraindication to a vaccine recognized by the CDC, the doctor must fill out a medical exemption form and provide a copy to the child's school. If the doctor feels a particular condition would serve as a contraindication, but it is not recognized by the CDC, the doctor can submit the exemption for review by the Immunization Branch. If a parent or guardian has a *bona fide* religious objection to a vaccination, he or she can submit a written statement to the school.

North Carolina has an excellent compliance rate for immunizations, typically among the best in the country. The annual kindergarten assessment consistently shows that statewide over 96% of kindergartners have the vaccinations required by law by the time they enter kindergarten.

Controlling the spread of infectious diseases through immunization is one of medicine's most significant accomplishments. Vaccination programs have proven to be a cost-effective means of disease prevention that have saved millions from death. Schools play a critical role in assuring that children in North Carolina are protected from vaccine-preventable disease. **NCMJ**

School-Based Substance Abuse Prevention: A Public Health Perspective

Anne Thomas, MPA; Sheila Davies

Schools are the environment where students plant, nurture, and grow seeds that will become their future lives. These seeds should encapsulate their hopes and dreams and serve as the foundation for whom they will become as adults. While many students dream of becoming doctors, teachers, lawyers, artists, or engineers, no student aspires to become an alcoholic or a drug addict. Sadly, many of today's students fall victim to the destructive, debilitating, chronic disease of addiction.

Dare County, North Carolina, a popular vacation destination, is not immune to the challenges of adolescent substance abuse. In 2005, there were 1,040 total arrests for young people ages 16-20 for alcohol and other drug offenses compared to 1,224 total arrests for individuals age 21 and over in the county. According to the 2005-2006 School Violence Report, Dare County Schools had a higher rate (4.8 per 1,000 students) of substance abuse violations than 70% of schools across the state. Dare County Schools averages a 6.1% positive result rate on random drug testing screens, which is nearly double the 2%-3% rate reported by most school systems with similar drug testing policies. Further revealing the problem of adolescent drug and alcohol use in Dare County are the self-reported usage statistics in the Search Institute 2005 Profile of Student Life Surveys:

- 23% of 8th graders reported alcohol use (17% national average)
- 63% of 12th graders reported having used marijuana (45% national average)
- Average age when local 12th graders reported first getting drunk was 13 or 14
- Average age for middle school students who reported having gotten drunk was 11.5
- Responses from Dare County students to the question: "If you came home from a party and your parents found out you had been drinking, how upset would they be?" indicate that many students perceive low levels of parent disapproval regarding alcohol use

- 29% of 12th grade students reported that their parents would not be upset at all or only a little upset to learn that he or she was drinking (18% of 11th graders, 15% of 10th graders)

In response to the alarming number of adolescent drug- and alcohol-related incidents, including overdoses and deaths, the community rallied to generate action. After an impassioned

“School-based substance abuse prevention programs are ideal because of their ability to reach large numbers of youth, including those traditionally underserved.”

community meeting in April 2006 with citizens pleading for support from government officials and community leaders, the Dare County Department of Public Health was asked to take the lead in developing a coordinated and comprehensive array of substance abuse services for our community.

The plan that grew out of this process utilized the findings of a comprehensive community needs assessment and resulted in the implementation of the Dare County Substance Abuse Demonstration Project, funded by state and local dollars, with the goal of building an effective prevention, intervention, and treatment system for Dare County that would serve as a model for the rest of the state. While intervention and treatment are important components of the plan to help those currently living with the chronic disease of substance abuse, a focus of our efforts are aimed at prevention, which is key to disrupting the cycle of addiction. If we are really to make a difference in lessening the burden for people afflicted with substance use disorders, and those around them, the goal should be to prevent anyone from acquiring the disease.

Anne Thomas, MPA, is the public health director of the Dare County Department of Public Health. She can be reached at annet@darenc.com.

Sheila Davies is the substance abuse project manager at the Dare County Department of Public Health.

School-based prevention programs are ideal because of their ability to reach large numbers of youth, including those traditionally underserved. Additionally, adolescent drug use has been linked with physical and cognitive health problems in early adulthood, another reason for early intervention to prevent drug use.¹ While it makes sense to deliver prevention programs in schools, the practice is not routinely occurring across North Carolina, including Dare County. The value of prevention is well-recognized, as illustrated by the Drug Free Schools Policy, but the consistent implementation of evidence-based prevention programs is not occurring. As part of the Dare County plan, we collaborated with Dare County Schools to implement Positive Action, an evidence-based program with proven outcomes in three areas: character development, behavior modification, and academic achievement. By selecting a program like Positive Action, with benefits to the school beyond prevention education, we have broadened support for drug abuse prevention. Both the Health Department and Dare County Schools embraced the effectiveness of the Positive Action program, as highlighted by the following verifiable improvements:²

- Drug, alcohol, and tobacco use reduced by up to 71%
- Violence reduced by up to 85%
- Criminal bookings reduced by up to 94%
- Academic achievement improved by up to 75% (reading, math, and combined scores)
- General discipline problems reduced by up to 90%
- Truancy reduced by up to 13%
- Suspensions reduced by up to 80%
- Absenteeism reduced by up to 45%
- Self-concept improved by up to 43%

Additionally, the Positive Action curriculum earned national recognition in 2006 from the US Department of Education What Works Clearinghouse as the only evidence-based character education program with strong evidence of positive effects for both behavior and academic performance on standardized test scores.³

The founding principle of Positive Action is that positive thoughts lead to positive actions, positive actions lead to positive feelings, and positive feelings lead back to positive thoughts. This program strengthens the intrinsic motivation to make positive choices for a lifetime. It is through this empowerment that youth learn to make choices that ensure healthy and productive lives. The positive action program is not only effective in thwarting substance abuse, but students in schools that use the curriculum exhibit measurable improvements in areas such as self-concept, healthy body and mind, managing self responsibly, getting along with others, being honest, goal setting, and conflict resolution. These character-building competencies are at the root of all behavior so that physical, intellectual, social, and emotional health are positively impacted. In fact, this is one of the primary reasons we chose the Positive Action program. Another reason is that community prevention programs that reach people in multiple settings and that present a consistent community-wide message are most effective. In addition to the

classroom components for grades K-12, the positive action program has a community, a counselor, and a family component, which we are currently implementing.

The Dare County Department of Public Health was able to draw on its long-standing collaborative working relationship with Dare County Schools for successful implementation of prevention education. The schools' mission is education while the public health mission is to promote and protect the community's health. We created a win-win situation with the schools achieving academic success while public health achieved the benefits of promoting health and preventing disease. Positive Action lessons correspond to the North Carolina Healthful Living Curriculum that is taught in physical and health education classes. The Dare County Department of Public Health manages and oversees the program's implementation. Public health educators teach the Positive Action lessons in the schools, and selected school personnel are trained to assist in the delivery. Taking the burden off teachers to assume additional workload certainly helps with buy-in. In the first year of implementation, over 700 lessons were delivered to more than 3,000 students. Within the next three years, the goal is to deliver the program to every Dare County student in grades K-12 each year. The positive benefits of Positive Action are already apparent and can be summed up best by these comments from a 9th grade student at the Dare County Alternative School:

I have made several changes in my life while going through the Positive Action program. One of my main changes is to pay more attention in school and to bring all of my grades up. The reason for that is to pass my grade and make my dad proud. The other change I have made is to get rid of the stress and drama in my life. I used to be really bad but then I realized when we did this lesson that I need to do something with my life and do right. It feels good to make good changes in my life. —Darion

Long-term success and sustainability of effective substance abuse prevention programs in the schools requires some fundamental changes to the way school health programs are currently delivered. The first is to require that all schools implement evidence-based programs to all students, kindergarten through 12th grade. Second, these programs need to be taught by competent, qualified staff who dedicate the appropriate time and effort to this subject. Because public health staff include prevention experts, this is a resource that should certainly be considered for this task. Third, schools must be held accountable for effective delivery of prevention programs including evaluation, outcome measures, and perhaps even testing. And last but not least, adequate funding must be allocated for this purpose. Prevention is far less expensive than treatment, yet historically funding for prevention has been very limited. In North Carolina, we spend about 6% of public substance abuse funds on prevention. This must change if we are to stem the tide of substance abuse in our communities.

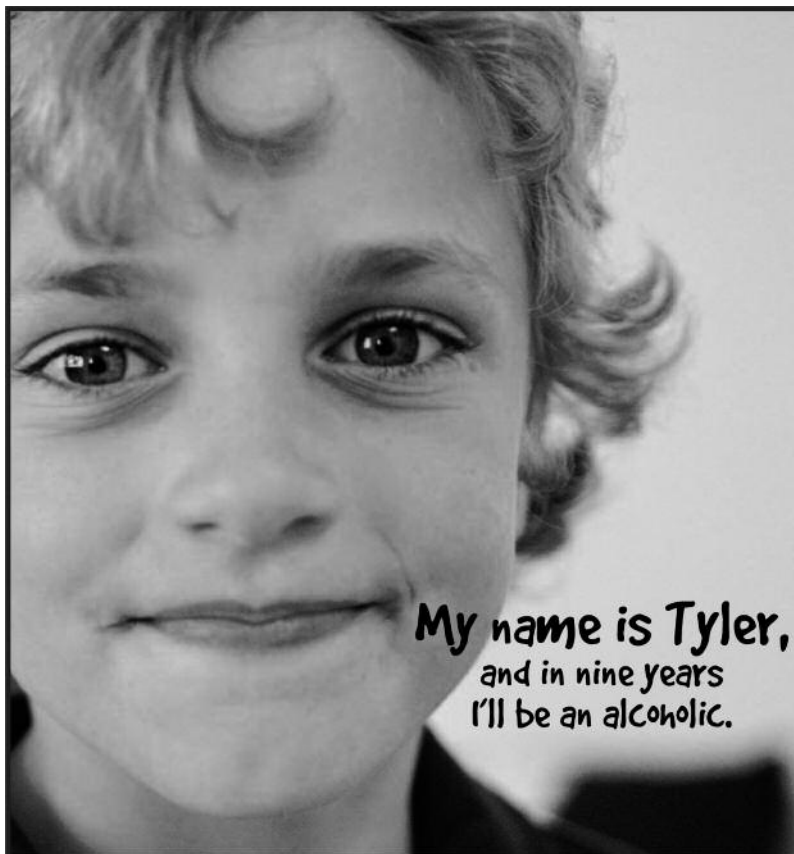
Helping children fulfill their hopes and dreams free from the constraints imposed by alcohol dependency and substance abuse is one of the greatest gifts we can give them. The first step

towards achieving this lies in consistent, effective implementation of evidence-based prevention programs, delivered in the schools by well-trained, qualified staff. Every child deserves to be given

the opportunity and tools to succeed, and prevention is the key that opens the door to a promising future. **NCMJ**

REFERENCES

- 1 Gately B. Teen drug use linked with later health problems. 2002. EurekAlert! website. http://www.eurekalert.org/pub_releases/2002-07/niod-tdu073102.php. Accessed November 10, 2008.
- 2 Positive Action, Inc. Research overview. 2008. Positive Action website. <http://www.positiveaction.net/news/index.asp?ID1=6&ID2=710&ID3=815>. Accessed November 10, 2008.
- 3 US Department of Education. What Works Clearinghouse Report: Positive Action a stand out. June 8, 2007. Positive Action website. <http://www.positiveaction.net/research/index.asp?ID1=3&ID2=25>. Accessed November 10, 2008.



Kids who drink before age 15 are 5 times more likely to have alcohol problems when they're adults.

**START TALKING
BEFORE THEY
START DRINKING**

To learn more,
go to www.stopalcoholabuse.gov
or call 1.800.729.6686



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Substance Abuse and Mental Health Services Administration
www.samhsa.gov



Teen Pregnancy in North Carolina

Kay Phillips

Every 28 minutes, a North Carolina teen becomes pregnant. Why should we care? Teen pregnancy can be associated with many other critical social issues such as poverty and income, health, education, child welfare, and irresponsible fatherhood. Risky behaviors such as drugs and alcohol, juvenile crime, and dropping out of school are linked with adolescent childbearing. If the trend of teen pregnancy could be turned, we would see a major reduction of social problems afflicting children in North Carolina as well as the United States. A decrease in school drop out rates, crime, and child abuse and neglect would be likely.

Teen pregnancies also result in the possibility that the child will have a higher rate of developmental risks. These children report poorer physical and mental health compared to children of planned pregnancies. A report from Child Trends indicates that after controlling for numerous background factors, two-year-old children who were born as a result of an unplanned pregnancy have significantly lower cognitive test scores when compared to children born as the result of an intended pregnancy.¹

Another challenge comes simply from the fact that the child is usually born to a single mother. When compared to children raised with two parents, the child of the one-parent family is more likely to be poor, drop out of school, and have lower grade-point averages, lower college aspirations, and poorer school attendance. The data suggests that reducing teen pregnancy will increase the proportion of children born into circumstances that better support their growth and development.¹

What Do the Numbers Say?

The United States has the highest teen pregnancy rate of all industrialized countries, and North Carolina ranks 37th out of the 50 states with 50 being the highest.² North Carolina's teen pregnancy rate continues to hold steady, with 2007 rates nearly the same as those over the previous four years. The five-year plateau follows a 14 year decline that resulted in the state's lowest ever rates in 2003. The state's adolescent pregnancy rate has

declined by 36% since 1992.³ The 2007 pregnancy rate for teens ages 15 through 19 was 63.0 pregnancies per 1,000 girls, compared to 63.1 per 1,000 in 2006, according to the State Center for Health Statistics.

The total number of North Carolina teens aged 15-19 who were pregnant in 2007 was 19,615. Nearly 29.4% of those pregnancies were to girls who had been pregnant at least once before. There were 404 pregnancies among 10 to 14-year-olds in 2007. Among minority populations, Hispanic teens had the highest pregnancy rate, although their rate has dropped nearly

“In North Carolina, only \$2.5 million is spent each year to prevent teen pregnancies. When weighed against the \$312 million spent to deal with the consequences of teen pregnancy it is clear that an increase in prevention dollars will benefit everyone in the long run.”

7% since 2003. The 2007 pregnancy rate among Hispanic adolescents in the state was 167.4 per 1,000 girls aged 15-19, a 3.3% decrease from the 2006 rate of 173.1. African American teens had a 2007 pregnancy rate of 87.1 per 1,000 girls, compared to 86.2 in 2006.³ The number of pregnancies among American Indian teens and other minority groups was too low to calculate reliable rates. In 1992, the minority teen pregnancy rate was two times higher than the Caucasian rate. The pregnancy rates have since narrowed.

A Look at the Nation

In the United States, the teen pregnancy rate is more than nine times higher than that in the Netherlands, nearly four times higher than the rate in France, and nearly four times higher than that in Germany.⁴ National data from the Youth

Kay Phillips is the director of the Adolescent Pregnancy Prevention Coalition of North Carolina. She can be reached at kphillips@appcnc.org.

Risk Behavior Surveillance System released by the Centers for Disease Control and Prevention (CDC) show that nearly half of all high school students have ever had sex and 7% had sex before age 13.⁵ Moreover, less than two-thirds of sexually active high school students report using a condom the last time they had sex.

During the 1990's progress was made regarding teen sexual behavior. Between 1991 and 2001 the proportion of sexually experienced high school students decreased by 16%, and the proportion of sexually active high school students who used condoms increased by 25%. Teen pregnancy and birth rates declined steadily each year. Teen sexual behavior in this decade is holding steady.¹ There has been virtually no change since 2001 in the proportion of high school students who have had sex or since 2003 in the proportion of sexually active high school students who used condoms the last time they had sex. The teen birth rate increased 3% between 2005 and 2006.²

The Economic Bottom Line

Teen pregnancy and child-bearing have significant economic and social costs. Progress towards reducing teen pregnancy will benefit the national and state economies and improve the educational, health, and social prospects of the teens and their children.

In North Carolina, the cost to taxpayers (federal, state, and local) associated with teen childbearing is estimated to be at least \$312 million in 2004, of which \$128 million (41%) are federal costs and \$184 million (59%) are state and local costs.² To break these figures down, the average annual cost in North Carolina of teen childbearing is \$1,503 per teen birth. It is important to note that costs of births to young teens are much greater than costs of births to older teens, and the average annual cost associated with a child born to a mother age 17 and younger is \$3,868. In North Carolina, only \$2.5 million is spent each year to prevent teen pregnancies. When weighed against the \$312 million spent to deal with the consequences of teen pregnancy it is clear that an increase in prevention dollars will benefit everyone in the long run.

Nationally, the overall cost to taxpayers is estimated to be at least \$9.1 billion a year. The total costs include those attached to teen mothers, their partners, and children born to teen mothers. The most significant costs are associated with poorer outcomes for the children of teen parents as compared to the outcomes for children born to mothers who are 20-21 years old.²

What Does Prevention Look Like in North Carolina?

In 1995 the North Carolina General Assembly revised the Basic Education Plan to include a comprehensive school health program. The health program includes instruction focused on disease control and abstinence education. In addition, the federal government has included requirements of abstinence education in No Child Left Behind (NCLB). The guidelines for NCLB contain little information on health and sex education, leaving

the states the power to develop their own laws, policies, and curriculum. What NCLB does provide, however, is clear and concise. NCLB prohibits the funds to be used to develop programs or distribute materials that are designed to encourage sexual activity, to distribute any obscene materials to minors, or to provide sex education or HIV prevention education unless that instruction is age appropriate and includes the health benefits of abstinence.⁶ NCLB further prohibits recipients of federal money from distributing contraceptives in schools.

The 1995 revisions made by the General Assembly of North Carolina include a complete K-9 health plan requiring all school systems to offer, among other topics, prevention of sexually transmitted disease (STD) and sexual abstinence until marriage instruction to all 7th, 8th, and 9th graders. The General Assembly further adopted policy guidelines to instruct the State Board of Education (SBE) or local boards when adopting curriculum or policy. Any program adopted by the SBE must provide biological or pathological information related to the human reproductive system. It must focus on the benefits of abstinence until marriage and the risks of premarital sexual intercourse and establish abstinence as the expected standard for all school-age children. Positive reinforcement for abstinence should be offered and opportunities for interaction between the parent and student should be given. Students are to be made aware of the difference between risk reduction through use of contraceptives and/or condoms and risk elimination through abstinence. For any instruction concerning contraceptive or prophylactics, accurate statistical information on their effectiveness and failure rates for preventing pregnancy and sexually-transmitted diseases, including HIV/AIDS, in actual use among adolescent populations must be given. Students must be informed of the current legal status of certain homosexual acts that are a significant means of transmitting diseases including HIV/AIDS. Students must understand that a mutually faithful, monogamous, heterosexual relationship in the context of marriage is the best lifelong means of avoiding diseases transmitted by sexual contact, including HIV/AIDS. They must be aware that the instruction in the use of and/or demonstration of condoms is a part of the sexuality education program.⁶ Following these guidelines, the SBE adopted curriculum objectives for STD prevention and abstinence until marriage for students in the 7th, 8th, and 9th grades.

Local boards of each school system must provide a comprehensive health education program that meets all the requirements of the Basic Education Plan and all objectives established by the SBE. A local board must conduct a public hearing before it "adopts" any health curriculum. The public hearing should adequately notify the community, and the board must allow for public inspection of all instructional materials and objective of the expanded sex-education curriculum 30 days before the hearing. The board must keep the instructional material and objections open for public review 30 days following the hearing. Each year before the students receive the sexuality instruction, the board must give parents or legal guardians an opportunity to review the objectives and materials. The local board must also develop a policy that

allows parents to either provide or withhold consent for their student's participation in any or all of these programs.

Neither the federal government nor the state prohibits a local school board from teaching about contraception, but the state does require curriculum about contraception to include accurate statistical information about its effectiveness and failure rate. The General Assembly also allows local boards to provide students information on where to obtain contraceptive if this information is included in the parental consent form. Under no circumstances, however, can a local board develop a program that makes available or distributes contraceptive to students. The SBE adopted objectives for teaching about contraception for 7th and 8th grade only. These students must receive information "on the effectiveness and failure rates of condoms as a means of preventing STDs

including HIV/AIDS."⁶ In the 8th grade this is reinforced with an expansion to include other forms of contraception.

Abstinence curriculum is the policy of North Carolina. Local boards must meet the minimum objective of contraceptive instruction. Since 1995, local school systems have been in a state of confusion and fear; therefore, many systems do not have any sexuality curricula in place even though it is mandated. Many professionals in the field believe we are seeing the repercussions since teen pregnancy is no longer in a decline. Efforts continue to be made toward educating school personnel and practitioners about the requirements of the state law. Until teen pregnancy is recognized as a reproductive health issue and that prevention is the key, North Carolina will continue to experience the reality of children having children. **NCMJ**

REFERENCES

- 1 Moore KA. Teen births: examining the recent increase, 2008. The National Campaign to Prevent Teen and Unplanned Pregnancy website. <http://www.thenationalcampaign.org/resources/reports.aspx>. Accessed October 3, 2008.
- 2 By the numbers: the public costs of teen childbearing in North Carolina, 2008. Putting What Works to Work, Number 25. The National Campaign to Prevent Teen and Unplanned Pregnancy website. <http://www.teenpregnancy.org>. Accessed October 3, 2008.
- 3 North Carolina State Center for Health Statistics, Division of Public Health. North Carolina Reported Pregnancies, 2007. Women age 14 through 19. <http://www.schs.state.nc.us/SCHS/data/pregnancies/2007>. Accessed October 3, 2008.
- 4 European approaches to adolescent sexual behavior and responsibility: European tour, 2006. Advocates for Youth website. www.advocatesforyouth.org. Accessed October 3, 2008.
- 5 Eaton DK, Kann L, Kinchen S, et al. Youth Risk Behavior Surveillance System-United States, 2007. *MMWR Morb Mortal Wkly Rep.* 2008;57(4):1-131.
- 6 Healthful Living Standard Course of Study 2006; Grades six through nine. North Carolina Department of Public Instruction website. www.ncpublicschools.org. Accessed October 3, 2008.

"We can't be at our best if we don't feel our best."

There are lots of great reasons to take multivitamins. Along with a balanced diet and regular exercise, they're a good way to stay in good health. For fast periods a day, multivitamins may help lower your risk of cancer, heart disease, and osteoporosis as well as prevent birth defects. So for a healthy, happy you, take a multivitamin everyday. To learn more, call 1-800-347-2229 or visit www.getfolic.com.

MULTIVITAMINS
TAKE THEM FOR LIFE

FOLIC ACID

In-School Prevention of Obesity and Disease (IsPOD)

Edgar G. Villanueva, MHA

The Kate B. Reynolds Charitable Trust has committed to invest more than \$3 million over the next four years in an effort to transform the physical education system in North Carolina elementary and middle schools. The ultimate goal is to influence students to make lifestyle changes that include higher levels of physical activity and improved nutritional behaviors.

The grant will support an initiative called the In-School Prevention of Obesity and Disease (IsPOD), which is being administered by the North Carolina Alliance for Health, Physical Education, Recreation, and Dance (NCAAHPERD) in partnership with physical education teachers in all 100 counties of the state. School systems in approximately 32 counties are using the program this year, and 25 additional systems will be added annually through the 2011-2012 school year. When implementation is complete, North Carolina will be the only state in the nation delivering a consistent, research-based physical education curriculum to all public school students in kindergarten through 8th grade.

Through this program, the Trust, NCAAHPERD, and state school systems have the potential to improve the overall health of the next generation of North Carolinians. Due to the increase in obesity and its associated diseases, the life expectancy for American children is declining for the first time in more than 100 years. If successful, IsPOD will help reverse that downward trend and will effect attitudinal and behavioral change among one million young people.

The IsPOD program is built around a specialized curriculum called Sports, Play & Active Recreation for Kids (SPARK), a research-based physical education curriculum for K-12 students. It is designed to combine healthy lifestyle messaging and take-home materials with physical activity exercises that promote participation among students on all grade levels. The program was developed by San Diego State University and includes training sessions for physical education teachers before they introduce SPARK in their classrooms.

Several benefits distinguish the IsPOD initiative from earlier efforts. First, the program is long-term. As kindergartners, students will be introduced to an active physical education class with emphasis on general health and fitness. Both the level of activity and the healthy lifestyle messages will continue and be reinforced for nine years. This is not a one-semester or one-year program. Children will have time to make lasting lifestyle changes. Second, Trust funding will cover staff training, manuals,

technology, equipment, evaluation, and follow-up. There will be no cost to schools, and the program will reach all children, regardless of their family's income level.

NCAAHPERD introduced IsPOD as a pilot program two years ago with support from the North Carolina Health and Wellness Trust Fund and the Blue Cross Blue Shield of North Carolina Foundation. It was implemented with kindergarten through 8th grade students in seven counties: Duplin, Durham, Robeson, Union, Iredell, Macon, and Jackson. More than 126,000 children experienced the pilot program, and preliminary data showed positive indicators of attitudinal and behavioral change.

From pre-test to post-test, results showed a slight increase in students' exposure to physical activity. Students reported spending less time on TV or video games and a greater likelihood of choosing activities such as bicycling, dancing, and outdoor games during their free time. Participating students reported enjoying physical activity and wishing they had more physical education classes. Eating habits also showed improvement. Students indicated greater consumption of fruit, fruit juice, green salad, and vegetables. Their post-tests also reflected less preference for sweets or high fat snacks.

Although body mass index (BMI) did not change significantly from pre-test to post-test, the lack of a significant increase in BMI as students aged seemed to indicate a positive program effect. However, interpretation of results was difficult without a nonparticipant comparison group.

During the pilot, NCAAHPERD trained more than 280 physical education teachers in using the SPARK curriculum. Simultaneously, NCAAHPERD representatives began working with the physical education departments of 16 university education programs to include preparation for their student to teach the SPARK curriculum with their students. Over the next four years, new physical education teachers will graduate fully prepared to implement the program in their first year of teaching.

"The SPARK curriculum provides teachers with sequential lessons that will help improve both fitness and skill levels of our students and is designed to encourage maximum participation during class time," said Lisa Queen, MA, NBCT, and physical education teacher at Troutman Middle School in Iredell County. "The program gives teachers the tools to provide better daily physical education for their students."

Edgar G. Villanueva, MHA, is a program officer in the Health Care Division of the Kate B. Reynolds Charitable Trust. He can be reached at edgar@kbr.org.

Surprisingly, traditional physical education classes provide an average of only 17.8 minutes of moderate to vigorous physical activity per student each week. IsPOD-trained teachers using the SPARK curriculum have increased the level of moderate to vigorous physical activity to 40.2 minutes per student per week.

Evaluating the program is an important part of the initiative. All tools utilized in the program are evidence-based and have embedded evaluation components. Participating teachers also receive FITNESSGRAM, a software tool that is a critical evaluation component. FITNESSGRAM tracks fitness results such as aerobic capacity, body composition, muscular strength, endurance, and flexibility and then facilitates communicating the findings to students and parents. Two times each year, students also complete surveys on physical activity and fruit and vegetable intake.

“The pool of data collected over the next four years will be the largest and most comprehensive ever made available for evaluating the success of a physical education program. It will be a gold-mine for researchers, educators, and public policymakers,” said Ron Morrow, executive director of NCAAHPERD.

This grant is one of the largest ever given by the Trust’s Health Care Division. Our partnership with NCAAHPERD

and school systems statewide makes it possible for us to work proactively to reverse the trend toward obesity and its associated diseases among school-age children. We believe IsPOD can improve the long-term health of North Carolina families while yielding evidence-based data that will be invaluable to educators and state legislators as they make decisions that set the course for physical education in our schools for decades.

NCAAHPERD is a not-for-profit organization whose mission is to provide advocacy, professional development, and unity for professionals and students in order to enhance and promote the health of North Carolinians.

The Kate B. Reynolds Charitable Trust is one of North Carolina’s largest private foundations with assets of more than \$500 million. The mission of the Trust is to improve the quality of life and quality of health for the financially needy of North Carolina. Based on free and reduced lunch records, 57% of the K-8 students who will benefit from this program meet the criteria for funding to the “financially needy of North Carolina” as stated in the mandate governing the Trust.

**ORGAN & TISSUE DONORS
SAVE LIVES**



For More Information Contact

Carolina
Donor Services
1-800-200-2672

www.carolinadonorservices.org

Thanks from the *North Carolina Medical Journal*

Without the voluntary assistance and carefully executed reviews of a number of anonymous reviewers, no journal can offer the kind of peer-review for submitted manuscripts that can assure its readers the highest quality of published articles. We are fortunate for the service of a number of individuals who have given generously of their time and expertise in service to the *North Carolina Medical Journal* this past year, and we are pleased to have this annual opportunity to acknowledge their efforts.

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

John W. Williams, Jr, MD, MHS
Scientific Editor

Reviewers of *North Carolina Medical Journal* Submissions for 2008

Ahmed A. Arif, PhD

Tristram D. Bahnson, MD

Denise E. Bonds, MD, MPH

Jane H. Brice, MD, MPH

Monique V. Chireau, MD

Charles Clinch, MD

Dana D. Copeland, MD, PhD

Christopher E. Cox, MD, MPH

Yancey Crawford, MPH

C. Annette DuBard, MD, MPH

David Edelman, MD

Ana Felix, MD

Brad N. Gaynes, MD, PhD

Joseph A. Govert, MD

Ruth Greenfield, MD

Thomas G. Irons, MD

George L. Jackson, MD

Alex Kemper, MD

Jennifer Kimbrough, MPH

Julienne K. Kirk, PharmD, CDE, BCPS

Rick L. Langley, MD, MPH

James Lowe, MD

Anne D. Lyerly, MD

Matthew Maciejewski, PhD

Chris McCudden, PhD

Merry K. Moos, RN, MPH

Gwendolyn Murphy, MD

Clay Musser, MD

Evan R. Myers, MD, MPH

Frank A. Neelon, MD

Richard C. Redman, MD

Rachel A. Royce, PhD, MPH

Paige Hall Smith, PhD, MSPH

Charles F. Wilson, MD

Tripp Winslow, MD, MPH



Running the Numbers

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

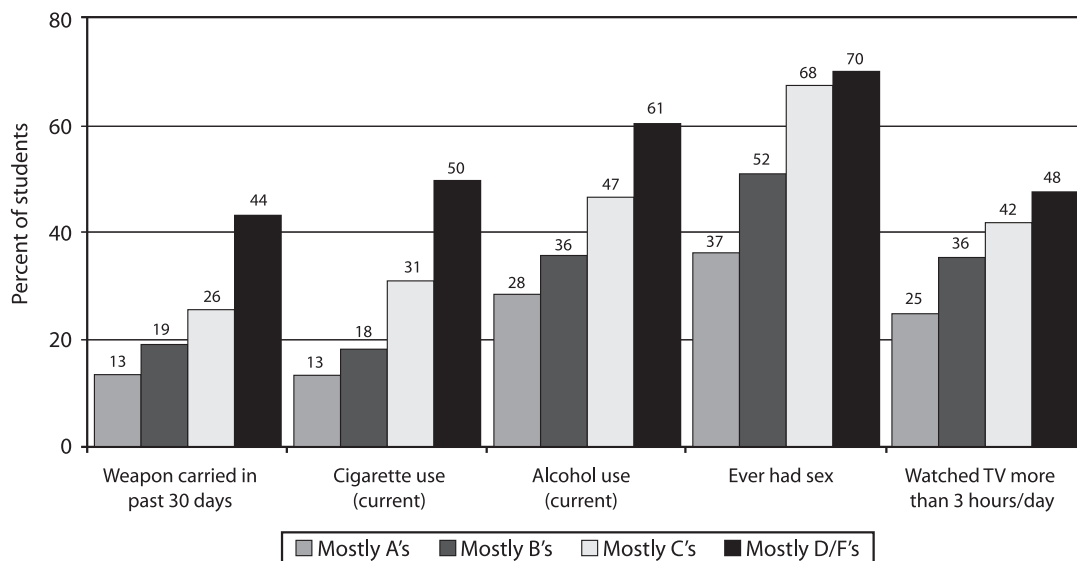
*From the State Center for Health Statistics, North Carolina Department of Health and Human Services
<http://www.schs.state.nc.us/SCHS>*

High School Student Health and Academic Achievement in North Carolina

The North Carolina Department of Public Instruction (NCDPI) reported that 7 in 10 (70.2%) of the 2004-2005 incoming high school freshman class in North Carolina graduated on time in 2008.¹ This 2008 graduation rate shows an upward trend from the 2006 and 2007 rates (68.3% and 69.5% respectively). Graduation from high school is associated with future increased annual and lifetime earnings as well as better health outcomes, and graduation is both an education and public health goal.²

The Centers for Disease Control and Prevention, Division of Adolescent and School Health (DASH), conducts a Youth Risk Behavior Survey (YRBS) that monitors the priority health risk behaviors that contribute to the leading causes of death, disability, and social problems among youth and adults in the United States. DASH has produced a series of analyses of national YRBS data reporting a significant relationship between these health risk behaviors and academic success: students with higher academic success generally have a lower level of the health risk behaviors.³ North Carolina Healthy Schools, in partnership with the North Carolina State University Center for Urban Affairs and Community Services (CUACS), performed parallel analyses with 2007 North Carolina YRBS data and will be releasing a series of high school and middle school health and academic fact sheets that will be available at www.nchealthyschools.org.

Figure 1.
Percentage of North Carolina High School Students Engaging in Selected Health Risk Behaviors, Stratified by Level of Academic Achievement



Source: 2007 North Carolina High School Youth Risk Behavior Survey
Produced by: North Carolina State University Center for Urban Planning and Community Service

The North Carolina YRBS is conducted by NCDPI in collaboration with the North Carolina Division of Public Health (NCDPH). Analyses of the data from the 2007 North Carolina YRBS show a similar inverse association between health risk behaviors and academic achievement. Figure 1 shows that North Carolina high school students with higher grades are significantly less likely ($p < 0.0001$ for each risk behavior) to have engaged in behaviors such as: carried a weapon (e.g. a gun, knife, or club on at least one day during the 30 days before the survey); current cigarette use (smoked cigarettes on at least one day during the 30 days before the survey); current alcohol use (had at least one drink of alcohol on at least one day during the 30 days before the survey); ever had sexual intercourse; and watched television more than three hours per day (on an average school day).

While this pattern of associations does not prove cause and effect, these data are important to both educators and health practitioners. If educators want to raise academic success and graduation rates, they can identify students with health risk behaviors as students likely to be in need of academic support interventions. Health professionals can identify students in need of health risk reduction by identifying students at risk for academic failure. These data demonstrate the need for a strong education and health partnership to reach the joint goals of increased graduation rates, a higher quality of life, and more globally competitive communities.

Overall, across the five health behaviors shown in Figure 1, North Carolina high school students compare favorably to United States high school students⁴ in current alcohol use (38% vs. 45%; $p < 0.01$); unfavorably in carried a weapon (23% vs. 18%; $p = 0.03$) and ever had sex (52% vs. 48%; $p = 0.05$); and are no different in regard to current cigarette use (23% vs. 20%) or watched TV more than three hours a day (35% for both North Carolina and the United States).

NCDPI and NCDPH have adopted an eight-component Coordinated School Health (CSH) model⁵ to reduce adolescent health risk behaviors. These components are health education; physical education/physical activity; health services; nutrition services; counseling, psychological, and social services; healthy school environments; health promotion for staff; and family and community involvement. The North Carolina State Board of Education Healthy Active Children Policy, effective in 2006, requires that there be a School Health Advisory Council (SHAC) in each of the 115 local education agencies (LEAs) in North Carolina. Health providers, educators, parents, and community members are encouraged to support and become involved in their local SHAC to impact health programs and policies. To find out more, contact your LEA or visit www.nhealthyschools.org.

REFERENCES

- 1 North Carolina Department of Public Instruction 4-Year Cohort Graduation Rate Report. 2004-2005 Entering 9th Graders Graduating in 2007-08 or Earlier, Results by Subgroup as of July 25, 2008. <http://aapp.ncpublicschools.org/2008/app/cgrdisag/>. Accessed October 10, 2008.
- 2 Freudenberg N, Ruglis J. Reframing school dropout as a public health issue. *Prev Chronic Dis*. 2007;4(4). http://www.cdc.gov/pcd/issues/2007/oct/07_0063.htm. Accessed October 7, 2008.
- 3 Centers for Disease Control and Prevention, Division of Adolescent and School Health. Healthy Youth, Student Health and Academic Achievement. http://www.cdc.gov/HealthyYouth/health_and_academics/index.htm. Accessed October 10, 2008.
- 4 Centers for Disease Control and Prevention, Division of Adolescent and School Health. Healthy Youth, YRBSS Youth Online: Comprehensive Results. <http://apps.nccd.cdc.gov/yrbss/>. Accessed October 3, 2008.
- 5 Centers for Disease Control and Prevention. Healthy Youth! <http://www.cdc.gov/HealthyYouth/CSHP/>. Accessed October 10, 2008.

Contributed by:

*Rebecca H. Reeve, PhD, CHES, Senior Advisor for Healthy Schools, North Carolina Department of Health and Human Services;
Sarah M. Langer, MPH, University of North Carolina Center for Health Promotion and Disease Prevention;
and Alissa S. Bernholc, MPH, Center for Urban Affairs and Community Services, North Carolina State University.*

HOW TO LIVE UNITED: JOIN HANDS.

OPEN YOUR HEART.

LEND YOUR MUSCLE.

FIND YOUR VOICE.

GIVE 10%. GIVE 100%.

GIVE 110%.

GIVE AN HOUR.

GIVE A SATURDAY.

THINK OF WE BEFORE ME.

REACH OUT A HAND TO ONE AND

INFLUENCE

THE CONDITION OF ALL.

GIVE. ADVOCATE. VOLUNTEER.

LIVE UNITED™



Want to make a difference? Help create opportunities for everyone in your community. United Way is creating real, lasting change where you live, by focusing on the building blocks of a better life—education, income and health. That's what it means to Live United. For more, visit LIVEUNITED.ORG.

★★★

WHY SOME PEOPLE THINK CELIA CRUZ IS TOM'S MOTHER.

★★★

KIDS DON'T GET ENOUGH ART THESE DAYS. Which is why some of them think that a certain international Cuban star is the mother of an international movie star – simply because their last names sound the same. But the similarities stop there.

Celia Cruz didn't start off as the Queen of Salsa. In her homeland of Cuba, Celia honed her unique vocal style with La Sonora Matancera, the Latin equivalent of the Duke Ellington Orchestra. She proved that women could sell as many records



In order to become larger-than-life-Latin superstar, you must take some risks.

as men. And when she immigrated to the United States, she joined forces with the Latin headliner Tito Puente. But it was in 1973 at Carnegie Hall when Celia burst onto the concert stage wearing flamboyant



The undisputed Queen of Salsa. Funny, she doesn't look like a hot sauce.

costumes, jewelry and wigs — with a voice that brought down the house. Salsa music had arrived.

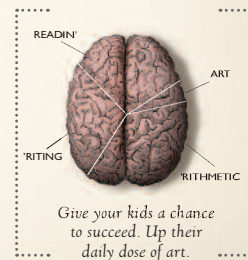
Musicians as varied as the Fania All-Stars, David Byrne and Willie Colón all wanted to work with her. She brought salsa music to the world. Every hot and spicy bit of it.

Art in any language has the ability to open minds. In fact, the more art kids get, the more knowledgeable they become in

subjects like math and science.

The result is that your kids will grow up to be well-rounded adults. Which is music to any parent's ears.

For the *Ten Simple Ways* to get more art in kids' lives, visit AmericansForTheArts.org.



ART.ASK FOR MORE.

AMERICANSFORTHEARTS.ORG



Spotlight on the Safety Net

*A Community Collaboration
Kimberly Alexander-Bratcher, MPH*

John H. Lucas, Sr. Wellness Center

The John H. Lucas, Sr. Wellness Center is a comprehensive medical home for middle and high school students located inside Hillside High School in Durham, North Carolina. It opened in December 1995, after the high school moved to its present location. In the previous Hillside location, students were able to visit Lincoln Community Health Center (LCHC) for their medical needs. During the planning for the new high school site, the administration asked the LCHC providers to help design a clinic there. When the Wellness Center became a reality, it was named for an outstanding former Hillside principal.

After more than 10 years of service, the John H. Lucas, Sr. Wellness Center provides an invaluable resource to the children and young adults in the community who may not have had regular access to medical care. Any middle or high school student can be seen at the Center any day of the week through a scheduled or walk-in appointment. As a satellite office of Lincoln Community Health Center, the Wellness Center follows the same guidelines for access to services. They offer a sliding fee scale for students without health insurance. More than 50% of the school's students have family incomes that qualify for free or reduced lunch programs and are more likely to be uninsured. The Center offers comprehensive primary care, immunizations, school and sports physicals, and a mental health social worker is available once a week. The staff includes a clinic manager who is a family nurse practitioner, a licensed practical nurse, and a receptionist.

As a member of the North Carolina School Community Health Alliance, the John H. Lucas, Sr. Wellness Center is committed to working with partner organizations in the community. At Hillside, the staff helps form a system of care in collaboration with the school nurse, guidance counselors, and a Child and Family Support Team made up of a social worker and nurse. In the past, a nutritionist from the Durham County Health Department has also been available to counsel students on healthy eating and exercise in order to prevent obesity. The intervention program was funded through a grant from the School Health Program of the Children and Youth Branch of the North Carolina Department of Health and Human Services.

Currently, in collaboration with Duke University and the Center for Child and Family Health, the Wellness Center also provides pregnancy prevention services. These services are offered to girls in the Supervised Psychotherapy for Adolescents Reacting to Chronic Stress (SPARCS) program, and aim to increase self-esteem and to prevent a second pregnancy in young women who already have a child. This work is in the third year of the larger ACCESS grant funded by the Kate B. Reynolds Charitable Trust.

Kathleen Loucks, FNP, serves as the clinic manager at the Center and loves the interaction between education and health. She explains that the best way to improve health is to help students graduate from high school and that students are better able to succeed when they come to school ready to learn. Teachers can then help students focus on education rather than have them miss school for medical reasons. Helping one child at a time, the John H. Lucas, Sr. Wellness Center is a prime example of a positive collaboration between quality health care and public schools.

Kathleen Loucks, FNP, clinic manager at the John H. Lucas, Sr. Wellness Center, contributed to this article.

UNITED STATES POSTAL SERVICE® Statement of Ownership, Management, and Circulation (All Periodicals Publications Except Requester Publications)

1. Publication Title: **North Carolina Medical Journal**

2. Publication Number: 0 3 9 2 | 9 0 0 0

3. Filing Date: 09/30/08

4. Issue Frequency: **BIMONTHLY**

5. Number of Issues Published Annually: **6 X A YEAR**

6. Annual Subscription Price: **\$ 42.00**

7. Complete Mailing Address of Known Office of Publication (Not printer) (Street, city, county, state and ZIP+4®):
630 DAVIS DR., SUITE 100, MORRISVILLE, NC 27560

Contact Person: _____
 Telephone (include area code): _____

8. Complete Mailing Address of Headquarters or General Business Office of Publisher (Not printer):
630 DAVIS DR., SUITE 100, MORRISVILLE, NC 27560

9. Full Names and Complete Mailing Addresses of Publisher, Editor, and Managing Editor (Do not leave blank):
 Publisher (Name and complete mailing address):
NORTH CAROLINA INSTITUTE OF MEDICINE AND THE DUKE ENDOWMENT
630 DAVIS DR., SUITE 100, MORRISVILLE, NC 27560 (Pam C. Silberman, Eugene W. Cochrane Jr.)
 Editor (Name and complete mailing address):
NORTH CAROLINA INSTITUTE OF MEDICINE (THOMAS C. RICKETTS III)
630 DAVIS DR., SUITE 100, MORRISVILLE, NC 27560
 Managing Editor (Name and complete mailing address):
NORTH CAROLINA INSTITUTE OF MEDICINE (CHRISTINE NIELSEN, MPH)
630 DAVIS DR., SUITE 100, MORRISVILLE, NC 27560

10. Owner (Do not leave blank. If the publication is owned by a corporation, give the name and address of the corporation immediately followed by the names and addresses of all stockholders owning or holding 1 percent or more of the total amount of stock. If not owned by a corporation, give the names and addresses of the individual owners. If owned by a partnership or other unincorporated firm, give its name and address as well as those of each individual owner. If the publication is published by a nonprofit organization, give its name and address.)

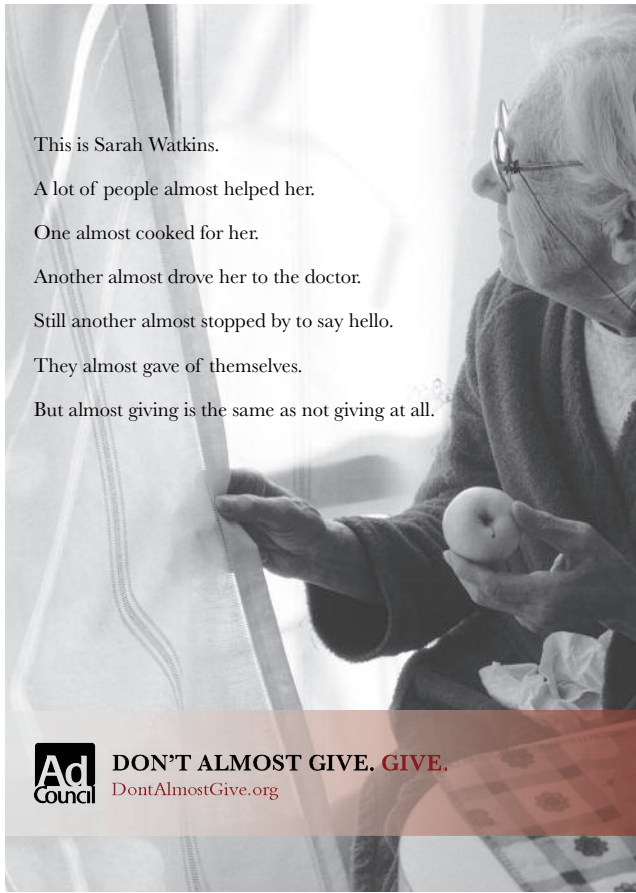
Full Name	Complete Mailing Address
NORTH CAROLINA INSTITUTE OF MEDICINE	630 Davis Dr., Suite 100, Morrisville, NC 27560
THE DUKE ENDOWMENT	100 North Tryon Street, Suite 3500, Charlotte, NC 28202

11. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages, or Other Securities. If none, check box None

Full Name	Complete Mailing Address

12. Tax Status (For completion by nonprofit organizations authorized to mail at nonprofit rates) (Check one)
 Has Not Changed During Preceding 12 Months
 Has Changed During Preceding 12 Months (Publisher must submit explanation of change with this statement)

PS Form 3526, September 2007 (Page 1 of 3 (instructions Page 3)) PSN 7530-01-000-9031 PRIVACY NOTICE: See our privacy policy at www.usps.com



This is Sarah Watkins.
 A lot of people almost helped her.
 One almost cooked for her.
 Another almost drove her to the doctor.
 Still another almost stopped by to say hello.
 They almost gave of themselves.
 But almost giving is the same as not giving at all.

Ad Council **DON'T ALMOST GIVE. GIVE.**
DontAlmostGive.org

13. Publication Title: **NORTH CAROLINA MEDICAL JOURNAL**

14. Issue Date for Circulation Data Below: **JUL/AUG 08**

15. Extent and Nature of Circulation

		Average No. Copies Each Issue During Preceding 12 Months	No. Copies of Single Issue Published Nearest to Filing Date
a. Total Number of Copies (Net press run)		34,252	37025
b. Paid Circulation (By Mail and Outside the Mail)	(1) Mailed Outside-County Paid Subscriptions Stated on PS Form 3541 (includes paid distribution above nominal rate, advertiser's proof copies, and exchange copies)	33,368	36011
	(2) Mailed In-County Paid Subscriptions Stated on PS Form 3541 (includes paid distribution above nominal rate, advertiser's proof copies, and exchange copies)	0	
	(3) Paid Distribution Outside the Mail Including Sales Through Dealers and Carriers, Street Vendors, Counter Sales, and Other Paid Distribution Outside USPS®	374	420
	(4) Paid Distribution by Other Classes of Mail Through the USPS (e.g. First-Class Mail®)	29	140
c. Total Paid Distribution (Sum of 15b (1), (2), (3), and (4))		33,771	36571
d. Free or Nominal Rate Distribution (By Mail and Outside the Mail)	(1) Free or Nominal Rate Outside-County Copies Included on PS Form 3541	0	
	(2) Free or Nominal Rate In-County Copies Included on PS Form 3541	0	
	(3) Free or Nominal Rate Copies Mailed at Other Classes Through the USPS (e.g. First-Class Mail®)	0	
	(4) Free or Nominal Rate Distribution Outside the Mail (Carriers or other means)	26	40
e. Total Free or Nominal Rate Distribution (Sum of 15d (1), (2), (3) and (4))		26	40
f. Total Distribution (Sum of 15c and 15e)		33,797	36611
g. Copies not Distributed (See instructions to publishers at (page 3))		454	414
h. Total (Sum of 15f and g)		34,252	37025
i. Percent Paid (15c divided by 15f times 100)		100	100

16. Publication of Statement of Ownership
 If the publication is a general publication, publication of this statement is required. Will be printed in the _____ issue of this publication. Publication not required.

17. Signature and Title of Editor, Publisher, Business Manager, or Owner: _____ Date: **9-29-08**

I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties).

PS Form 3526, September 2007 (Page 2 of 3)

A Great Advertising Investment!

Published by the North Carolina Institute of Medicine and The Duke Endowment

North Carolina MEDICAL JOURNAL
a journal of health policy analysis and debate

School Health Policy in North Carolina

Also on the cover: North Carolina Child Health Report Card

Contact Phyllis Blackwell, assistant managing editor
phyllis_blackwell@nciom.org or 919.401.6599 ext. 27.

Readers' Forum

Dear Editor:

The Heart Prevails: It sounds like the title of a country music song, but in actuality it is much more than that. The Heart Prevails Act is an important and successful piece of legislation that I introduced in a bipartisan effort with Representatives Hugh Holliman, Debbie A. Clary, and William L. Wainwright. Governor Easley signed the bill into law over one year ago. The new law converts the existing heart symbol on the North Carolina Driver's License from an intention to legal consent for organ and eye donation. Since October 2007, there has been an overwhelming increase in donations. The North Carolina Eye Bank reports that during the first full year of the law's existence, transplants have increased by 56% in North Carolina.

Last year, North Carolina was fifth in the nation in the percentage of citizens consenting to be a donor; over three million people had shown their willingness to be an organ donor by allowing the organ donor heart symbol to be printed on their driver's license. At the same time, the state was 16th in the nation in organs actually recovered due to uncertainty about relying on the donor heart symbol in making critical decisions to aid recovery of organs.

Prior to the passage of the Heart Prevails Act, North Carolinians were able to indicate their preference to become an organ donor by including a heart on their license, but the graphic did not allow emergency or hospital personnel to rely on the heart symbol as a first-person directive. For years, most North Carolinians were unaware that selecting the heart to be displayed on their driver licenses did not automatically mean their wishes to become a donor would be legally honored. The Heart Prevails legislation puts this practice into action by making each individual's wish a reality.

"This is excellent news for those on the transplant waiting list," said Lloyd Jordan, president and CEO of Carolina Donor Services. "There is a shortage of organ donors and as a result there are thousands waiting for transplants. This law puts the decision-making power in the hands of the donor."



Three years ago, there was no donor registry in North Carolina. The new law covers all current drivers with hearts on their licenses and also makes it easier for citizens to change their donor status online by visiting www.donatelifenc.org, a registry created and maintained by the North Carolina Department of Motor Vehicles. If a person has indicated that he or she would like to be an organ donor, the procurement agencies work with families to walk them through the process of honoring their loved one's wishes.

In the 2008 Short Session, the Heart Prevails Act was altered to allow 16-year-olds to donate blood in North Carolina. This has the potential of adding 25,000 pints a year to the North Carolina blood supply.

The public may request additional information or download a uniform donor card by calling 1.800.200.2672 or by visiting www.carolinadonorservices.org.

Dale R. Folwell
74th District (Winston-Salem)
North Carolina House of Representatives
dalef@ncleg.net

The success of the Heart Prevail Act would not have been possible without the interest and passion of the North Carolina Division of Motor Vehicles under the direction of Commissioner William Gore and Program Director Tony Spence, along with the efforts of the North Carolina Division of Motor Vehicles Driver's License Examiners; the North Carolina Hospital Association, the North Carolina Medical Association, North Carolina Hospice, North Carolina Eye and Tissue Bank, the North Carolina Funeral Home Examining Board, the Funeral Directors & Morticians Association of North Carolina, the North Carolina Medical Examiner, various organ procurement organizations, Mrs. United States of America for 2006, Shannon Devine, and the North Carolina Trial Lawyers Association.

Editor's Note:

The article on Inclusive Health in the (Sept/Oct 2008) inaccurately characterized maternity benefits. Please visit www.inclusivehealth.org for the most up-to-date information on benefits and program requirements.

*When you take steroids, there's no hiding it.
Eventually everyone will see you for what
you really are. A fake. A fraud. An asterisk.*



DontBeAnAsterisk.com



Classified Ads

Physician Solutions is Accepting Curriculum Vitas from Family, Pediatric, and Internal Medicine Doctors. We are the leading locum tenens physician staffing company in NC and our current demand exceeds our supply of physicians. If you are a licensed physician in NC and would like to earn an exceptional wage for a few days per month or become one of the several full-time physicians enjoying the freedom locum tenens allows, please contact us. Phone: 919.845.0054. Website: www.physiciansolutions.com. Email: physiciansolutions@gmail.com.

Considering Selling or Buying a Medical Practice? We have over 20 years experience working with medical practices like yours. We actively talk with physicians and practice executives every day. If you would like to sell your practice fast and maximize your rewards, now could be the perfect time. We handle each client professionally and confidentially. Philip Driver and Company, Accredited Business Intermediary and member of the American Business Brokers Association specializing in Medical Practices. Website: www.philipdriver.com. Email: driverphilip@gmail.com.

Physician Assistant Successful Modern Practice Seeking a Physician Assistant to Join Our Staff. Must be dynamic and flexible. Outstanding benefit plan and salary. Fax resume to 704.283.7939 or mail to Benedict Okwara, MD. First Care Medical Clinic, 404 Sutherland Avenue, Monroe NC 28112. Email to BOKWARA@aol.com.

Coming in the January/February
2009 issue of the

**North Carolina
Medical Journal**

a look at:

**Substance
Abuse**

**“WHEN I HAVE AN
ASTHMA ATTACK
I FEEL LIKE A FISH
WITH NO WATER.”**

—JESSE, AGE 5



ATTACK ASTHMA. ACT NOW.

1-866-NO-ATTACKS
WWW.NOATTACKS.ORG



CCDIS 1001

North Carolina
MEDICAL JOURNAL

**CLASSIFIED ADS: RATES
AND SPECIFICATIONS**

The *Journal* welcomes classified advertisements but reserves the right to refuse inappropriate subject matter. Cost per placement is \$60 for the first 25 words and \$1/word thereafter.

Submit copy to:

email: ncmedj@nciom.org

fax: 919.401.6899

mail: *North Carolina Medical Journal*

630 Davis Drive, Suite 100

Morrisville, NC 27560

Include phone number and billing address, and indicate number of placements, if known.

Is Your Practice Looking for a Physician?

The *North Carolina Medical Journal* classified section is one of the few channels that reaches large numbers of North Carolina physicians with information about professional opportunities. More than 20,000 physicians now receive the *Journal*.

Our classified ads can help your practice find the right physician as well as help physicians find compatible career opportunities.

Index of Advertisers

Physicians' Premier Resource for Practice Management



Knowledge

Knowledge

Offering forms, financial tools, information on medical records, compliance, and other practice specific resources.



Seminars

Seminars

Lunchtime Lessons, our internet-based learning program will present monthly topics of interest from the convenience of your office.



Productivity

Productivity Support

Practice Specific personal consultations can offer you a solid guide of where your practice can improve. Practical advice on everything from front desk operations to denial management is now available.



www.ncmedsoc.org/practessentials
or call us at: (800)722-1350

NORTH CAROLINA
MEDICAL SOCIETY



PractEssentials
A North Carolina Medical Society Foundation Initiative

Lorena Ochoa
LPGA GOLF PRO

Natalie Gulbis
LPGA GOLF PRO

Karrie Webb
LPGA GOLF PRO

Marlo Gil
JUMP ROPE PRO

Get up
and play.
An hour a day.



Be a player. Encourage your kids to get out and play. It's good for them, good for you and just good fun. So grab a jump rope. Turn a cartwheel. Dance. Wiggle. Shake a tail feather. As long as you're moving, you're a player, too. Find lots of easy ways to get active at www.SmallStep.gov.



Mission Trip
Fanmilk Junction, Ghana



THERE ARE REASONS WHY, WHEN YOUR REPUTATION
IS ON THE LINE, YOU CAN DEPEND ON OURS.



WALKER ALLEN
TRIAL ATTORNEYS

Walker, Allen, Grice, Ammons & Foy, L.L.P.
1407 West Grantham Street / Post Office Box 2047 / Goldsboro, North Carolina 27533-2047
Telephone: 919.734.6565 / Facsimile: 919.734.6720
www.nctrialattorneys.com