THE UNIVERSITY OF IOWA

IOWA FLUORIDE and BONE DEVELOPMENT STUDY NEWS

DECEMBER 2004

BUSY TIMES for ALL OF US

The youngest children in our study are nearly ten years old, while the oldest will soon turn 13! The opportunities for these children are endless! During these ages, children are involved in all kinds of athletics – football, volleyball, basketball, soccer, swimming, tae kwon do, gymnastics, softball, baseball. You name it, and someone in our study is involved in it! To add to the list, there is band, choir, academic competitions, 4-H, scouts, community involvement, school clubs and so on! All of this on top of school! Your commitment to your children's enrichment is amazing!

With all of the comings and goings, eating patterns are not what they were when we parents were kids ourselves. Remember sitting down to a home cooked meal with all (or nearly all) of your family present? That was commonplace. Leisurely family dinners have taken a back seat to meals on the go and eating what you can when you can. Most vans these days seem to double as cafeterias! As new food products continue to appear on supermarket shelves, it's clear that a big question on the minds of producers and consumers is, "Is it portable?" When we consider how we lived and ate when we were kids, it becomes clear that lifestyles and eating habits are on the move.

The impact of these lifestyle changes is what we in the Iowa Fluoride Study and Iowa Bone Development Study are investigating so closely. We have gotten a tremendous response from parents who have chosen to be bone densitometry participants in our study. You have also provided us with reports of physical activity and dietary habits from your past and present. This information, combined with your bone density measurements and blood samples, is giving us a much clearer picture of the many variables that impact bone density.

As 2004 comes to a close and we get ready to greet 2005, an enormous thank you goes out to all of you! Other institutions, researchers, and clinicians are looking to us for research leadership in the areas of dentistry and pediatric bone development. Your commitment to our research is what makes this all possible.

Wave UPDATE

- The doors are nearly closed on what we have called the "Second Wave" (age 9 scans and parental scans). If you previously chose not to participate in the parent component, it is not too late to change your mind. Please contact us toll free at 1-888-857-7038 if you have reconsidered.
- We are well into the "Third Wave" of the study. In the third wave, we perform a bone scan on the children at about age 11. We will not perform dental exams on the children in the third wave because the dental component is in a holding pattern until the children in our study turn 13. This is because most of the primary teeth are gone and we are waiting for the rest of the permanent teeth to come in.
- And finally, we expect to begin the "Fourth Wave" about mid-year, 2005. In this phase, we will conduct bone density scans and dental exams on the children at age 13.

LINK BETWEEN DIET and YOUR TEETH

When it comes to the link between diet and tooth decay, what people eat could be less important than how or when they eat it. But there is little conclusive research showing how different foods or combinations of foods impact your teeth and mouth. Even less is known about exactly how those foods that seem harmful lead to a higher risk of cavities. Dr. Teresa Marshall, a registered dietitian and investigator with our study, leads our efforts to analyze nutritional information from three-day food diaries yielded during the first 8 years of our study, and from exams and more recent questionnaires as well. All these data will be linked with the information from the dental exams. Of particular interest are the types of beverages consumed by youngsters – soda pop, fruit juices, milk, etc. – and how they affect the teeth. Our hope is that this information will help determine how food types, beverage types, eating methods, and meal timing affect the development of cavities and fluorosis in young children.

MEET the STAFF —

Dr. Marcia Willing is a medical geneticist and pediatrician who has been with the Iowa Bone Development Study for the past eight years. She directs the laboratory studies that focus on identifying genetic factors that influence development of healthy bones. Dr. Willing has been at the University of Iowa for over thirteen years. Her main areas of interest include identifying genetic risk factors for common conditions such as osteoporosis and heart disease. She is also interested in understanding conditions that lead to fragile bones. Through the Regional Genetics Consultation Service, Dr. Willing sees patients around the state of Iowa who have genetic conditions, and she is the director of the Connective Tissue Disorders Clinic at the University of Iowa Hospitals and Clinics. Dr. Willing is married to Charles Pruchno, a physician and kidney specialist in private practice in Cedar Rapids. They have two children (Gabrielle, age 13 and David, age 10) five cats, and two dogs. In her spare time, Dr. Willing enjoys gardening, biking, traveling, and collecting fancy colored shoes.

Dr. Teresa Marshall is a registered dietitian who works with the collection and analyses of dietary data collected in the Iowa Fluoride Study and the Iowa Bone Development Study. She has been investigating the relationships between dietary factors and dental caries and fluorosis. Teresa grew up in Serena, Illinois and graduated from the University of Illinois with a bachelor's degree in Hospital Dietetics. She completed her Dietetic Internship at the University of Iowa Hospitals and Clinics and received her PhD in Human Nutrition from the University of Iowa College of Medicine. She worked as a clinical dietitian with children with developmental disabilities and joined the College of Dentistry faculty in 1991. In addition to working with the IFS, she teaches nutrition and coordinates Experiential Learning (problem-based learning) courses in the College of Dentistry.

April Miller is a person you may have met if you've had a bone scan. She is one of the imaging technologists at the Clinical Research Center. She has been working with the Iowa Fluoride Study and Iowa Bone Development Study for the past year. April grew up in Dunkerton, IA, a small town 15 miles north of Waterloo. She received her bachelor's degree in Radiation Science from the University of Iowa and then completed a certificate program in Radiologic Technology also at the University of Iowa. She and her husband Eldy, the marketing and sales director for Stoney Creek Marble Products, live in Cedar Rapids. They have a one-year-old pug, named Bugsy, and are expecting their first child in March, 2005. In her spare time, April attends Iowa Hawkeye football games, entertains friends at her home, and enjoys traveling.

IFS RESEARCHERS on NATIONAL FLUORIDE DATABASE PROJECT TEAM

Three members of the Iowa Fluoride Study (IFS) research team are members of a national research project supported/coordinated by the National Institute of Dental and Craniofacial Research and the National Heart, Lung and Blood Institute. These individuals are Dr. Steven Levy (IFS Director), Dr. James Wefel (IFS fluoride laboratory director), and Ms. Judy Heilman (IFS fluoride lab coordinator). The IFS team is working with colleagues at the University of Minnesota School of Public Health, Virginia Polytechnic Institute, and the U.S. Department of Agriculture's Nutrient Data Lab. Researchers are collecting and testing a nationally representative sample of beverages and foods for their fluoride content. IFS is both contributing samples and conducting testing of the samples. Researchers plan to develop a database with the study findings. The study's resulting database will help dental and public health researchers nationwide with future studies of fluoride intake and relationships of food and beverage intake to human health.

VITAMIN SUPPLEMENTS and DIETARY INTAKES

An article about the use of vitamin and mineral supplements among the Iowa Fluoride Study participants will soon be published in the *Journal of the American Dietetic Association*. We evaluated the responses to the vitamin questions from birth to 2 years old in our mailed questionnaires. We found the use of nutrient supplements was a common behavior during the first two years. A substantial proportion of young children used supplements and prevalence of use increased with age. By the end of 2 years, 31.7% of our participants used some type of supplement and consumed them regularly. They took them about one-half of all days reported.

We also examined the adequacy of vitamins and minerals in the diets based on the information you supplied in the 3-day food diaries. We found that the majority of young children in our study could obtain adequate vitamins and minerals from diet alone for the first 24 months of life based on recommended dietary guidelines. This information confirms the high quality of dietary intake among our study participants.

TOOTH FAIRY UPDATE...

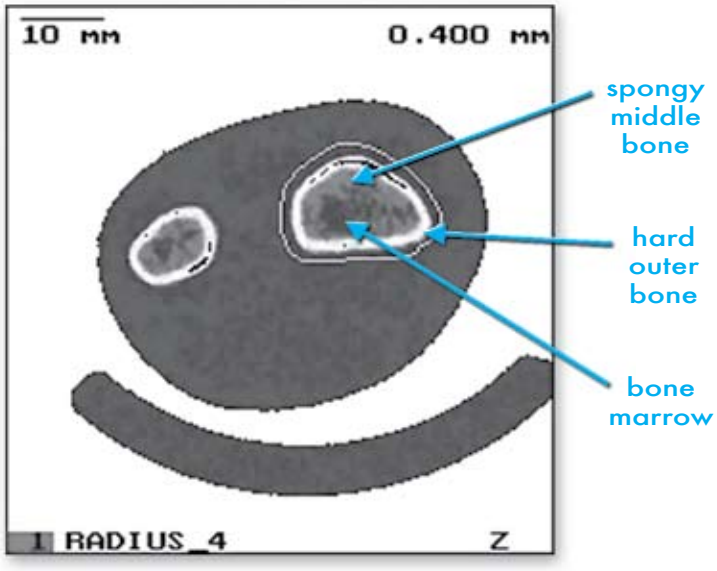
Thanks to all of you that have sent in second molar baby teeth after they have either fallen out or been pulled. So far, 86 study participants have shared one or more teeth with us! We will have the teeth analyzed for fluoride content to clarify our understanding of how fluoride is incorporated into tooth structure and how fluoride intake has affected your children's teeth. Those of you with 10-year-olds will be hearing from us as your child reaches approximately 11 years of age. If teeth fall out before that and you are willing to share them, please hold on to them until we contact you.

STUDY to LOOK at PLAQUE and SALIVA

The Iowa Fluoride Study has just begun a new component that involves collection of saliva and dental "plaque" from children's second permanent molars. We will freeze these samples and then apply for additional grant funds to perform detailed analyses of the types and strains of bacteria in different locations on the teeth. We will relate these findings to the children's cavity patterns. We are starting to collect plaque and saliva when children come in for their age-11 bone scans and plan to collect samples again at age 13.

WHAT is a pQCT SCAN, and WHY DO WE USE IT?

Dietary intake, specifically fluoride intake, is known to affect mineralization of both teeth and bones. Few studies have comprehensively assessed fluoride intake and related findings to bone measures. One of the goals of the Iowa Fluoride Study and Iowa Bone Development Study is to investigate the impact of the intake of fluoride and other dietary components on the bone characteristics of healthy young children. We are fortunate to have this information available to us. The questionnaires, diet diaries, and water samples you provided over the past several years provide the necessary dietary information, and the clinic visits provide bone information. At those visits, we take a special scan of the arm and leg with an instrument called a peripheral quantitative computerized tomographer (pQCT). The pQCT enables us to look at a cross sectional slice of bone (see right). From this cross sectional slice, we are able to distinguish the hard outer bone, the spongy middle bone, and the bone marrow. We think that dietary intake affects the bone compartments in different ways. The information gained will add to data already collected about normal bone in children. We will keep you posted as we learn more about these relationships.



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