THE UNIVERSITY OF IOWA

IOWA FLUORIDE and BONE DEVELOPMENT STUDY NEWS

JANUARY 2004

TIME for NEW THINGS

We all struggle with time – so many things to do; so little time to do them. We have to pick and choose what to include and at the Iowa Fluoride/ Bone Study (IFBS), we're so grateful that you feel our research is worthwhile. It takes a lot of time to fill out questionnaires and come in for exams. Time is valuable. It says a lot about your values that you devote some of that precious resource to research!

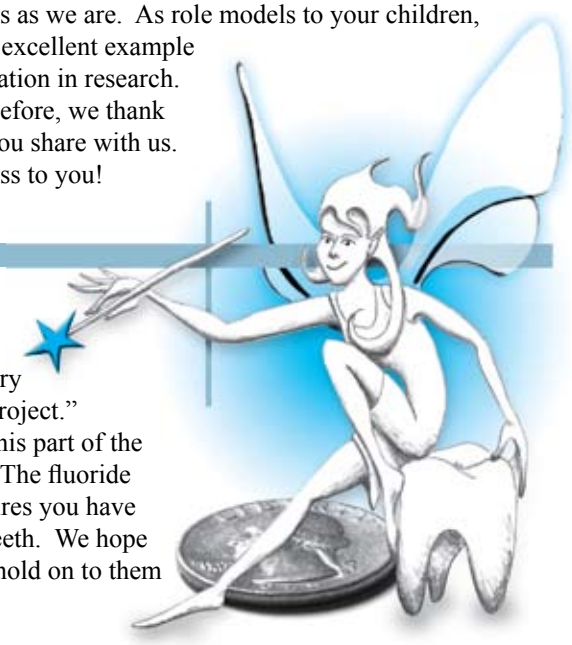
Our schedulers are busy setting up appointments for the youngest kids as we move toward the end of our "Second Wave" of the IFBS (see page 3 for more details). This wave has met with great success! And we are thrilled with the large number of children who have chosen to participate in the second wave bone scans, even though they did not participate at age 5! Every bit as exciting is the number of parents who have elected to participate in the study and have had bone scans themselves! Of those kids we've seen for second wave bone scans, 99% of their mothers and 73% of their fathers have also participated in some part of the study (if you previously chose not to participate in the parent component, it is not too late to reconsider—just call us at 888-857-7038). We hope that the feedback we've given you has been useful. Remember, if you ever need more detailed information, let us know.

We have quite a few children still to see for the dental exams. Many did not have their teeth in far enough when they came in for bone scans. If your child falls in this category, you will be contacted shortly to make those arrangements. Perhaps your child's school has a day off and that would be a good time to be seen. If this is the case, feel free to call us at 1-888-857-7038.

As we know you are aware, your child is changing by leaps and bounds and will continue to do so for several years. Our hope is to keep a close eye on the changes in his/her bone development. Hence, we are just starting the "Third Wave" of our study. This involves bone scans of the children at age 11. (We will generally not perform dental exams on the children in the third wave because we want all the teeth to come into the mouth first. We will examine the children's teeth again when they turn 13.) You will be sent a packet with more information on the third wave as your child reaches the appropriate age.

In April of 2003, we modified all of our documents to meet the requirements of the new federal HIPAA (Health Insurance Privacy and Portability Act) legislation. Our procedures didn't change because we have always regarded confidentiality as the highest priority. We simply needed to inform you that other collaborating research institutions and our funding sources have access to our research information.

Our researchers have been busy at meetings this year, presenting data that have been collected thus far in the study. This research is highly regarded and our team has emerged as national leaders concerning bone and dental research in children. We hope you are as proud of this as we are. As role models to your children, you are setting an excellent example with your participation in research. As we have said before, we thank you for the time you share with us. We owe our success to you!



HAS the TOOTH FAIRY VISITED YOU YET?

Some of you have already been contacted by us and are participating in the "Laboratory Examination of Baby Teeth Project." Others will be hearing from us as your children reach 10½ to 11 years old. The purpose of this part of the study is to get baby tooth second molars so that fluoride levels in the teeth can be analyzed. The fluoride levels in the teeth can then be related to the fluoride information provided on the questionnaires you have returned. This will give us an even better picture of how fluoride has affected your child's teeth. We hope you will all keep this mind if your child loses his/her molars before we contact you. Please hold on to them until we contact you!

MEET the STAFF —

If you've recently had your dental exam, then you may have met **Dr. Mike Kanellis**. He, along with Dr. John Warren, is one of the two dentist examiners on our team. He not only examines the children's teeth for signs of fluorosis and tooth decay, but also takes impressions and photographs of the teeth. Dr. Kanellis has lived in Iowa City since 1968. He received his DDS degree from the University of Iowa in 1976. He then went on to receive master's degrees in Pediatric Dentistry and in Dental Public Health, also from UI. From 1981 to 1994, he was in private practice in Muscatine before joining the UI faculty full-time. His wife, Amy, is a guidance counselor at West High School here in Iowa City. He has two sons – Nick (18) who is a freshman at Northwestern University, and Alex (16) who is a junior at West High.

You may not have seen her in person, but if you are in the Bone Development part of our study, you have worked with her from a distance. **Dr. Kathleen Janz** directs the physical activity component of the Bone Study. Originally from Wisconsin, she has been on the faculty at Iowa since 1991. Physical activity and physical fitness are her research interests, especially how they determine health outcomes like cardiovascular disease, osteoporosis, and obesity. Because these diseases have their roots in childhood, a great deal of her work (like our study) involves children and adolescents. Since joining our study team, she has worked hard to understand how physical activity impacts bone development. In addition to research, Dr. Janz also teaches in the College of Liberal Arts and Sciences and the College of Public Health. She runs and lifts weights regularly with the understanding that healthy bones are dependent on healthy muscles. She is also studying TaeKwonDo and hopes to have her black belt by the time she reaches 50!

Marlys Dunphy is a registered dietitian who has been with the Study for three years. She edits and verifies data from the food diaries and food frequency questionnaires as well as participates in the dietary interviews at the Clinical Research Center. In addition, Marlys coordinates the Laboratory Examination of Baby Teeth Project, in which some of you are already participating. She also writes/edits this newsletter as well as the Dental Public Health Graduate Program Newsletter and is working on developing a web page for the study.

Marlys grew up in Dubuque, Iowa and graduated from Clarke College with a bachelor's degree in Nutrition. After completing her Dietetic Internship at the University of Minnesota Hospitals in Minneapolis, she moved to Iowa City. For 25 years she worked at the University of Iowa Hospitals, first as a patient care dietitian and then as director of the Dietetic Internship Program. During that time she also completed masters' and educational specialist degrees in the UI College of Education. In her spare time, Marlys enjoys traveling and reading mystery novels.

Barb Broffitt is a statistician who has been with the Study for almost 3 years. She manages most of the data that are collected and performs statistical analysis for the many research presentations and papers prepared by our staff. Originally from Des Plaines, Illinois, Barb received her bachelor's degree from Central Missouri State University and master's degree in statistics from the University of Iowa. She worked with research projects in the Colleges of Liberal Arts, Nursing, and Law before joining the IFS team. Barb's husband, Jim, is professor and chair of the University of Iowa Department of Statistics and Actuarial Science. Son Dan, 24, is married and completing an architecture internship in Iowa City. Daughter Ginny, 22, is in graduate school at Cincinnati Conservatory of Music. Barb enjoys gardening and doing volunteer work at River Community Church.

Heather Pallister has been working with the Study since its beginning. In fact, she recruited some of you! Currently, she coordinates the collection of fluoride and calcium levels of all types of city water supplies and also schedules appointments for the bone and dental exams.

Heather grew up in Perry, Iowa and graduated from the University of Iowa with her bachelor's degree in Dental Hygiene. In addition to working part-time with the IFS, she has worked in dental hygiene private practice for the past 12 years. She and husband Rick, who works in marketing for the Principal Financial Group, have a daughter, Hannah who is 1 year old, and a cat, Fitzpatrick. Her hobbies include walking, biking, shopping, jewelry making, traveling, and spending time with family and friends.

WHAT'S NEXT for the BONE STUDY?

In last year's newsletter we mentioned that we were applying for a renewal of the Bone Development Study. Recently we received word from the National Institute of Dental and Craniofacial Research (NIDCR) that our grant was renewed! This will help support us during the next 4 years, as we will continue to gather important information every 6 months by mailed questionnaire.

During our Study we have used the term "Wave" to identify the time frames for our examinations. The "First Wave" examinations occurred when our study participants were about 4 to 6 years old. Those from about 7½ to 9½ are the "Second Wave." Now we will be starting the "Third Wave" exams and here's an update on what will be happening.

The Third Wave examinations will focus primarily on children's bone development at age 11. When your child reaches about age 10¾ -11, we will send you written materials and then call you to set up an appointment. At age 11, several children's bone scans will be scheduled. These are similar to those done at earlier examinations. In addition, we will assess grip strength, height and weight, and stage of physical development. Also, we will collect dietary information and obtain a new blood sample. This will allow us to assess the different genes possibly related to bone development and body composition.

For most of you, the Third Wave does not include a children's dental exam or parents' bone scans, unless they were not done at the Second Wave. If they were not done during the Second Wave, however, they can be done at the Third Wave exam. These Third Wave procedures are very important and will provide very valuable information about bone development into early adolescence. We look forward to your participation!

KEEPING UP with NEW TECHNOLOGY

We all know that technology is constantly changing. It is no different for those of us working in the Bone Study. The ways that we measure bones and body dimensions continue to change and improve. Dr. Julie Gilmore, Research Coordinator for the Fluoride and Bone Studies, has recently attended conferences on new technology for bone measurements. In addition to the standard DXA measurement that tells us how much bone a person has, we have begun using computerized tomography (also called a CT scan). It tells us more about the quality of the bone. CT measurements take a picture of a slice of bone and let us look into its interior. From this picture, we can learn more about the effects of diet and exercise on the two major bone components. These are the hard exterior shell and internal spongy bone. The best sites for measuring these are the forearm and the lower leg. These will be measurements we make as part of the third wave.

ACTIVE KIDS become ACTIVE ADULTS...RIGHT?

Active kids are more likely to remain lean and healthy during their youth, and inactive adolescents are more likely to become adults who do not exercise. It seems, however, that physically active children do not necessarily grow up to be adults who exercise. These are findings from the Iowa Bone Development Study in combination with another study in Amsterdam, Netherlands.

The Iowa Bone Development Study looked at changes in activity during middle childhood (roughly kindergarten through third grade), which is an important transition period for children. Results show that kids who maintained high levels of vigorous activity during this period are more likely to stay lean as they mature, whereas those children who watched a lot of TV are more likely to gain weight. Other activity patterns such as moderate activity and video game playing were not associated with leanness in this study. The Amsterdam study followed young people over 23 years from ages 13 through 36. It showed that being active or inactive in early adolescence does not necessarily predict actvity levels in early adulthood.

To summarize, these studies suggest a couple of important ways to help your children stay lean — encourage daily, vigorous, out-of-breath activity; and limit TV viewing. And, although inactive children are more likely than their peers to become inactive adults, it is certainly not true that a physically active youth ensures an active adulthood. This means that we can't trade our past athletic glories for the health benefits of remaining active. To be most effective, it appears that physical activity must be a life-long activity!

LOTS to LEARN from YOUR GENES

Genetic factors play an important role in bone development in children, attainment of peak bone mass during adolescence and bone loss in older adults. It has been estimated that about 50 to 80% of a person's bone mass is genetically determined. As part of the Iowa Bone Development Study, we have been examining the roles that genes and lifestyle factors (physical activity, diet) play in bone mineral build-up in children. We have selected for analysis genes that are involved in bone structure and mineralization (calcium metabolism). We have identified a link between two bone structure genes (the COL1A2 and the osteocalcin genes) and bone mineral density and bone mineral content in Iowa children. Our results were recently published in the journal, *Osteoporosis International*. Additional studies are planned with these genes to further refine these relationships. During the second and third waves, we will be looking at new genes that may be involved in body size and bone development in children. In addition, we are examining genetic factors in the parents and how they contribute to bone development in their children. Finally, we are also studying how genes interact with physical activity and diet to build healthy bones.

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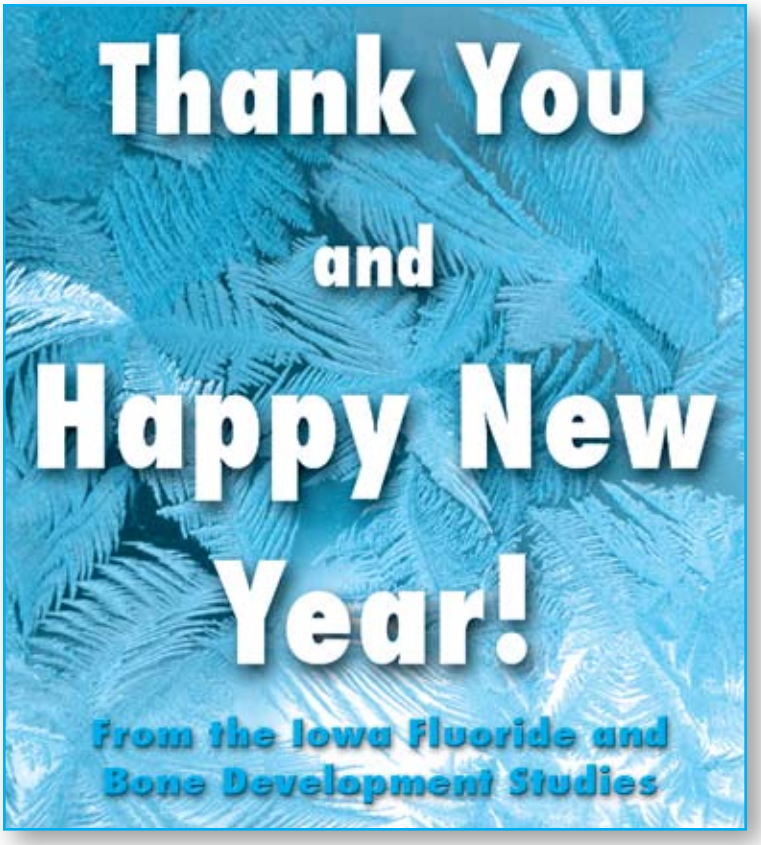
BITE PROBLEMS and THUMB/PACIFIER SUCKING

One part of the IFS questionnaire asks about thumb, finger and pacifier sucking. We have used this information you provided to find out how such habits affect the size and shape of dental arches. At the dental examinations, we also can tell how the teeth come together when we obtain dental impressions and models of your child's teeth. Many articles have been published on this topic for professional journals such as the *Journal of the American Dental Association* and *Pediatric Dentistry*. Our findings show that about half of the children stop thumb or pacifier habits between their 2nd and 3rd birthdays. But, many children continue these habits, particularly thumb habits, beyond 5 years of age. Perhaps more importantly, we found that, in general, the longer children continue habits beyond their 2nd birthday, the more likely they are to have bite problems. Both pacifier habits and thumb/finger habits can produce these bite problems. However, these two types of habits generally produce different types of bite problems. Another interesting part of our study involves comparing our findings with a University of Iowa study from the early 1950's. It appears that children today are more likely to have less space available in their dental arches, contributing to crowding of the teeth.



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