

# Lead Watch

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A Publication of the Coalition to Prevent Lead Poisoning  
Committed to Ending Childhood Lead Poisoning by 2010  
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## Research Links Lead, Osteoporosis

*LeadWatch* is the CPLP newsletter, designed to share news and information about the prevention of childhood lead poisoning.

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News to share with CPLP members and friends?

Suggestions for the newsletter?

Send information to:  
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J. Edward Puzas, Ph.D., the Donald and Mary Clark Professor of Orthopedics at the UR Medical Center, studies the impact of lead on bones. He presented some of his findings at the CPLP meeting in January. The following is this editor's synopsis of that presentation.

### **P**bones

While we often focus on the impact of lead on brain development in children, we must also recognize that lead damages many parts of the body, with consequences that are realized throughout life. 95% of the body burden of lead is actually in the skeleton, where it has a half-life of 20 to 30 years (compared to around 30 days in blood). The damage done is felt both in the bones themselves and throughout the body when lead is released into the blood and soft tissues. Let's start with the bones:

### Lead Stunts Growth, Increases Fractures

The reason we all stop growing taller at some point is a process in which the body signals to the bones that they are mature. Lead causes this message to be sent prematurely, before the natural growth process is complete. As a result, there is a loss of 2 cm of

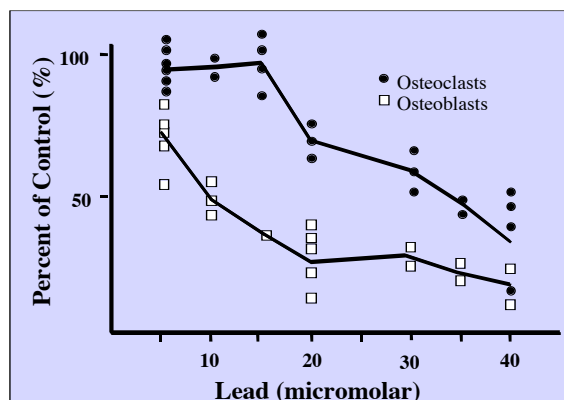
height for every 10 µg/dL of blood lead. A further consequence is that bones never achieve their potential peak density. There is less bone at maturity so that when bone begins to wear away (through natural aging and the lead-related acceleration discussed below), bone fractures can occur earlier and more frequently.

### Lead Impairs the Natural Healing Process

When bones fracture, nature goes to work to repair them by building new bone and knitting the new to the old. But lead interferes with this process in two ways. First, lead causes faulty bone formation. Then, the "maturity signal" once again is sent prematurely, so the bone "thinks" it is done before real healing has taken place. The fracture heals imperfectly, and takes longer.

### Lead Contributes to Osteoporosis

Bones regenerate themselves throughout our lives through the complementary action of osteoclasts, which take away bone, and osteoblasts, which create new bone. The process allows the body to access the calcium in bones when it is needed and keep bones strong with new cells, while continually balancing the depletion with new bone. As long as the two sides are in balance, everything works fine. Lead depresses the activity of both osteoblasts and osteoclasts,



more... will, be eradicated. □

### *Osteoporosis, continued...*

but the impact is much greater on the osteoblasts. So bones suffer because old bone is not making way for new bone to the degree that it should, and the old bone that is taken away is not balanced by an adequate formation of new bone. This bone loss is known as osteoporosis.

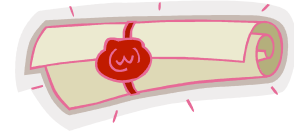
Interestingly, early studies on the linkage between elevated lead and osteoporosis missed the connection: It seems that lead in bones artificially elevates bone mineral density as measured by the DEXA test, a standard clinical measure of bone strength. When corrected for this measurement problem, studies show that both men and women with elevated bone lead have significantly lower bone density than their unexposed counterparts.

### **Lead Moves Back Into the Blood**

When the body senses that it needs more calcium, such as during pregnancy, a message is sent to increase the action of the osteoclasts in pulling calcium from its storehouse in the bone. But the body cannot distinguish between calcium and lead. So when the osteoclasts go to work, lead is released into the blood stream. During pregnancy, the lead in the blood travels to the fetus where it begins to poison yet again. During menopause the same process occurs; research tells us that blood lead increases by between 2 µg/dL and 5 µg/dL. (Menopausal women might well wonder whether lead is contributing to the mood swings and lack of impulse control that are so often caricatured in references to menopause.)

Scientists are continuing to explore the impact of lead on all parts of the body and through all ages. The more we learn, the more we understand: lead poisoning is simply unacceptable. It must, and it

## **Coalition Adopts Bylaws**



CPLP has adopted the bylaws that will govern the operations of the organization. The bylaws are based on the vision, mission, goal, and guiding principles of the Coalition. There are five major components that all Members should understand.

### ***Decision-Making***

The Coalition will continue its current practice of seeking consensus on all decisions. If consensus cannot be reached after a good faith effort using a structured, facilitated process, a vote may be called. Action requires the agreement of at least 75% of those eligible to vote; this ensures that the voice of the most affected communities is heard in all decisions.

### ***Member Responsibilities***

Membership is open to all who commit to our goal and our principles and join at least one committee. Interested and dedicated individuals who are not able to join a committee will be welcomed as Allies, a category of membership that may participate in every way except the right to vote. This ensures that the decisions of the Coalition are made by those who do the most work.

Members have responsibility for amending bylaws and the certificate of incorporation and for electing the at-large members of the Board of Directors and the Officers of the Coalition. They will receive and review the annual financial audit, the annual work plan and progress toward goals, and the 3-year strategic review.

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### ***Board of Directors***

The bylaws establish a Board of Directors to be the governing body of the Coalition. The Board will consist of the officers, the immediate past co-chairs, the co-chairs of committees, and up to three at-large individuals (who will be chosen to assure the needed skills and functions of the Board as well as to help balance the representation of the most affected community).

The Board will have the standard governance responsibilities, including ensuring that the Coalition is financially and programatically viable, holding the Managing Director accountable, and establishing operating policies and protocols.

### ***Committees***

Committees will be established by the Board of Directors. Chairs will be nominated by the committee members and ratified by the Board. The existing committees will continue as committees of the membership; in addition, there will be two committees of the Board – an Executive Committee and a Leadership Development Committee, responsible for training and development of Directors to increase capacity of the Directors individually and the Board as a whole to lead the Coalition and problem-solve at the community level.

### ***Conflict of Interest***

Any Member or Director who may realize a personal or business gain or loss as a result of a Coalition decision will inform the Membership, Board, or Committee of the potential conflict and refrain from participating in the decision (whether by consensus or vote).

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