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## Nitroglycerin Boosts Bone Density and Bone Strength

### *Researchers call it unique and promising*

**Toronto, February 22, 2011** – Nitroglycerin is best known as a high explosive or a treatment for angina, but a new study in the February 23 issue of the *Journal of the American Medical Association (JAMA)* says it may also be an effective therapy to strengthen bones and treat osteoporosis.

“Our findings demonstrate that nitroglycerin ointment, in very low doses, can increase bone density and improve bone geometry,” says Sophie A Jamal, MD, PhD of the Women’s College Research Institute and University of Toronto, Canada, and the lead author of the study. “Nitrates are widely available and inexpensive. As such these agents might be a promising way to reduce osteoporosis worldwide.”

“This is an exciting new treatment that is unlike any other drugs now used for osteoporosis,” says Steven R. Cummings, MD, of the San Francisco Coordinating Center at the California Pacific Medical Center Research Institute, and the senior author of the study. “While other treatments work by either slowing the breakdown of bone, or increasing bone formation, nitroglycerin does both at the same time. It’s a unique quality that leads to an apparent increase in bone strength.”

Jamal, Cummings, and researchers at the University of Toronto, Canada, followed 243 postmenopausal women for 24 months in a single centre, double-blind, placebo controlled study. The women, none of whom had osteoporosis, were randomly assigned to receive either nitroglycerin ointment or a placebo. They pasted the ointment onto their skin at bedtime.

At the end of the two year study women who were assigned to the nitroglycerin ointment group saw an increase of 7 per cent in the bone mineral density (BMD) in their hip bones compared to women who were given a placebo. BMD indicates bone quantity - a strong indicator of fracture risk.

“One of the most striking effects was the increase in cortical width or the thickness of the bone,” say Jamal and Cummings. “The nitroglycerin group saw an increase of almost 25 per cent in their legs and an increase of 15 per cent in their arms, compared to the placebo group. This was unexpected because it’s not something you see with existing therapies.”

There were some side effects of the treatment: about 25 per cent of women had headaches with nitroglycerin and did not participate in the study. Of women who were enrolled, about 5 per cent stopped because of headache.

The researchers say the results from the study are very encouraging but further larger trials are needed, both to replicate these findings and to determine the effects on fracture, before any treatment recommendations can be made. Because nitroglycerin is not a patented product further research would most likely involve the support of, and funding from, the National Institutes of Health.

### **About Women’s College Research Institute (WCRI)**

Women’s College Hospital has established the WCRI as Canada’s largest research institute dedicated solely to generating knowledge about women’s health.

As Canada's only facility that tests women's health-care innovations within an ambulatory care environment, WCRI is forging new ground by focusing on key areas of women's health and sex- and gender-based medicine: women and violence, mental health, genetics and cancer, obstetrics, osteoporosis, diabetes, and HIV/AIDS.

**About California Pacific Medical Center. Beyond Medicine**

At San Francisco's California Pacific Medical Center, we believe in the power of medicine. We research the most up-to-date treatments, hire the most qualified individuals, and practice the most modern, innovative medicine available. We deliver the highest quality expert care, with kindness and compassion, in acute, post-acute and outpatient services, as well as preventive and complementary medicine. But we also believe that medicine alone is only part of the solution. That's why we look intently at each individual case and treat the whole person, not just the illness. It's why we go beyond medical care and provide our patients with things like disease counseling, family support and wellness treatments. As one of California's largest private, community-based, not-for-profit, teaching medical centers, and a Sutter Health affiliate, we are able to reach deep into our community to provide education, screening and financial support in some of the city's most underserved neighborhoods. Medicine can transform a body. But going beyond medicine can transform a life. [www.cpmc.org](http://www.cpmc.org)

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For more information please contact:

Jodi Salem  
Women's College Hospital  
416-323-6400 ext. 4054  
[jodi.salem@wchospital.ca](mailto:jodi.salem@wchospital.ca)

Kevin McCormack  
California Pacific Medical Center  
416-600-7484  
[McCormKD@sutterhealth.org](mailto:McCormKD@sutterhealth.org)