

The Growing Importance of Bone Health

Diseases of the bones and joints, including osteoarthritis, osteoporosis, and similar conditions, affect millions of Americans every year. For osteoarthritis alone, the number of individuals at risk will increase dramatically by 2030 when an estimated 70 million Americans will be 65 or older.

U.S. medical schools and teaching hospitals, together with the National Institutes of Health (NIH), are working to better understand the many diseases and conditions that affect bone health, and find new and better prevention and treatment strategies.

The following examples of recent NIH-funded research advances achieved at these institutions hold promise for individuals suffering from, or at risk of developing, osteoarthritis and similar conditions:

2007

Older women who take a commonly prescribed class of antidepressants known as SSRIs lose bone mass more quickly than women who are not on the medication, new research shows. Serotonin transporters, which are found in bone, were inhibited by the SSRIs, a group of drugs that includes Prozac, Lexapro, Paxil, and Zoloft.

University of Minnesota Medical School

Researchers are hoping to discover the genetic triggers for rheumatoid arthritis, and thus potentially provide pathways to early diagnosis and treatment. Currently, the condition is not diagnosed until it is too advanced to treat effectively; available treatments address symptoms but do nothing to eradicate the disease.

Rush University Medical Center

Rheumatoid arthritis patients treated with the drug hydroxychloroquine (HCQ) were found to be as much as 77 percent less likely to develop diabetes as compared to those who never took the drug, according to a 20-plus-year study.

University of Pittsburgh School of Medicine

2006

Investigators have determined that calcium and vitamin D supplements in postmenopausal women have a modest effect on bone mineral density and prevent hip fractures in certain groups, but do not prevent other bone fractures.

Ohio State University College of Medicine
University at Buffalo The State University of New York School of Medicine and Biomedical Sciences

The Osteoarthritis Initiative, a study of 5,000 people at risk of developing osteoarthritis of the knee, is providing unparalleled database images and clinical outcome information for researchers. Researchers hope the data will help facilitate osteoarthritis studies.

Johns Hopkins University School of Medicine
Memorial Hospital of Rhode Island
University of Maryland School of Medicine

Two popular nutritional supplements, glucosamine and chondroitin sulfate, do not reduce pain effectively in many patients with osteoarthritis of the knee, although the combination may be effective in patients with moderate to severe knee pain caused by other conditions. The study calls into question the daily use of these two over-the-counter supplements, which are heavily marketed as osteoarthritis pain relievers.

Indiana University School of Medicine
Johns Hopkins University School of Medicine
University of Nebraska Medical Center
University of Utah School of Medicine

Researchers have discovered the gene that causes fibrodysplasia ossificans progressive, or FOP, a rare condition in which the body's muscles and connective tissue change to bone. The discovery may be relevant not only for FOP patients but for those with more common skeletal conditions like osteoarthritis.

University of Pennsylvania School of Medicine

The AIDS virus accelerates development of osteoporosis, according to a study on the condition. HIV augments the growth of bone-dissolving agents known as osteoclasts. The findings could lead to new anti-osteoporosis drugs.

Columbia University College of Physicians and Surgeons

Researchers found that even after accounting for the contribution of age, women with lower levels of the hormone estradiol had greater risk for subsequently developing knee osteoarthritis. Changes in naturally occurring sex steroid hormones such as estradiol (the primary estrogen in premenopausal and early perimenopausal women) may explain why knee osteoarthritis becomes more prevalent among women during midlife.

University of Maryland School of Medicine

2005

Data show that men with prostate cancer who were receiving hormone suppression therapy had up to 50 percent more bone fractures than men who were not receiving the therapy.

University of Texas Medical Branch at Galveston

Researchers determined several factors that affect bone health in middle-aged women. Quantitative relationships that play a role in the “calcium economy” of women at midlife include calcium absorption efficiency, calcium losses through urine and digestive juices, and certain hormonal changes.

Creighton University School of Medicine

2004

Research targeted a gene therapy that eliminated the genetic mutations associated with osteogenesis imperfecta, or brittle bone disease, in adult stem cells. This may result in new treatments for the relatively rare genetic disease.

University of Washington School of Medicine

A specific genetic variation more than doubles the risk for rheumatoid arthritis, a team of investigators found. This genetic variation also significantly increases risk for systemic lupus, type 1 diabetes, and autoimmune thyroid disease.

North Shore-Long Island Jewish Health System

University of California, San Francisco, School of Medicine

University of Minnesota Medical School

2003

Insights into cartilage development and maintenance may help promote understanding of how to prevent progressive cartilage loss in osteoarthritis patients. So-called cytokine-induced transcription or reproduction factors involved in cartilage development and homeostasis were also found to be expressed in the cartilage of osteoarthritis patients.

Weill Cornell Medical College

For more information about how medical schools and teaching hospitals are fulfilling the promise of medical research, go to www.aamc.org/ftp.