Osteoporosis NASA Style

Osteoporosis is a major public health problem as everyone knows. Our awareness of osteoporosis and the magnitude of the problem have come under greater scrutiny in recent years.

With the awareness of what a major public health risk osteoporosis is several new medications have been developed to combat it.

One type of osteoporosis that we don't often think about is the loss of bone density due to weightlessness.

As space flight has progressed over the last four decades, physicians have learned that humans do not do well in a zero gravity environment. After about thirty days, the effects of weightlessness cause the body to begin to lose muscle mass, aerobic function and bone density.

Scientists have recently reported that the physical deterioration in space which astronauts will experience after a six month flight from Earth to Mars would be so severe that the astronauts would not even be able to build a space station or shelter on Mars. The gravity on the Red Planet is about one half of that found on Earth.

Unless the National Aeronautics and Space Administration can find ways to prevent these physical losses, there will never be a multi-year mission. Deteriorating muscles and bones have been referred to by researchers as show-stoppers

Presently, astronauts in the Space Station are required to workout six days a week for ninety minutes at a time. Thirty of these minutes are spent revving up their cardiovascular systems on a bicycle or treadmill. Their goal is to keep their heart rate between fifty and eighty percent of their maximum rate.

In space, astronauts spend at least one hour six times a week on a resistance training machine that uses rubber cords to strengthen muscles and help prevent bone loss.

Of the physical problems associated with space travel, bone loss or osteoporosis is viewed as the

most critical to overcome. Normally, bones are kept strong in large part by the stress and pressure of walking. Small vibrations created by the foot meeting the ground and its gravity fortify the musculoskeletal system. Without that, bones become weakened. In space your body says "it doesn't need these bones", said the author of a fitness book about space travel. It really is very similar to what happens when someone remains in bed for an extended period of time.

Think of all the osteoporosis that physicians unwittingly created in the past when patients were routinely kept in bed for a month after back surgery.

I can remember vividly when I was in grade school my father underwent a lumbar laminectomy for a ruptured disc. He was kept in bed and in the hospital for a month while waiting for his back to heal. He did well following the back surgery, but I often wonder how long it took to overcome the muscle weakness and osteoporosis that was created by the imposed period of bed rest.

Also, it is interesting to speculate how many patients had deep vein thrombosis and pulmonary embolus during extended periods of bed rest for various conditions while their physicians were only trying to help them.

How interesting it is that yesterday's gospel becomes something that is completely unthinkable and wrong today.

Thomas J. Haverbush, MD. P.C.

Office Address:
315 E. Warwick Dr., Suite A
Alma, Michigan 48801
989-463-6092
Fax 989-463-8914

Website Address:
www.orthopodsurgeon.com