

STATICS ($F_{net} = ma, a = 0$) Unit 3 also 6 & 7, Dr John P. Cise, Professor of Physics, Austin Com.

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Send Dr Cise an e-mail on how you used this application please. Thanks. Dr Cise

Site at NYTimes

http://www.nytimes.com/2011/10/01/health/01hip.html?_r=1&ref=health

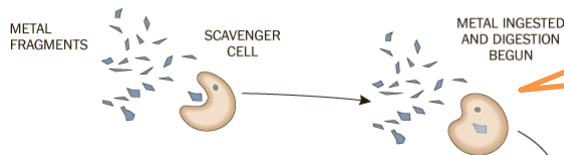
Remedy Is Elusive as Metallic Hips Fail at a Fast Rate

BOSTON — As surgeons here sliced through tissue surrounding a failed artificial hip in a 53-year-old man, they discovered what looked like a biological dead zone. There were matted strands of tissue stained gray and black; a large strip of muscle near the hip now longer contracted.

HOW METAL DEBRIS REACTS WITH THE BODY

When metal fragments are released into the body, scavenger cells arrive to engulf them.

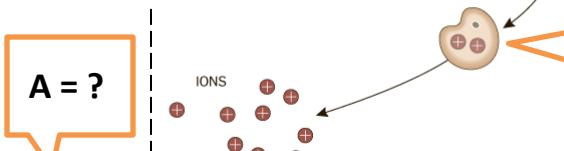
The scavenger cells are able to ingest and partially digest the metal fragments.



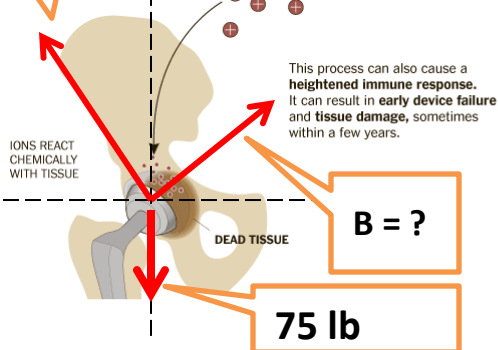
Scavenger Cells eat metal chips

In the digestion process, the metal particles are broken down into ions, or charged particles, which can react with tissues.

DIGESTION BREAKS METAL FRAGMENTS INTO IONS



Cell Digestion breaks metal fragments into positive ions



This process can also cause a heightened immune response. It can result in early device failure and tissue damage, sometimes within a few years.



INTRODUCTION: Force A is at 60° to the horizontal. Force B is at 45° to the horizontal. Force down is 75 lb and is essentially $\frac{1}{2}$ the person's weight.

QUESTIONS: Find force A & B using static equilibrium concepts?

HINT: If $a=0$ then F_{net} in X and y direction must = 0.

ANSWERS:

A = ~ 54.74 lb
B = ~ 38.55 lb

Similar scenes are playing out at hospitals nationwide as a growing number of patients seek to have faulty

metal-on-metal artificial hips removed and replaced. More than a decade ago, some researchers had warned that the hips shed tiny pieces of metallic debris that posed potential health threats to patients. But those warnings were not heeded, and now doctors and patients face a growing public health problem as one of the country's biggest medical device failures unfolds. Some patients with all-metal hips — ones in which the cup and ball of a joint is made of metal — said they had been bounced from doctor to doctor who did not have the knowledge or the tools to properly diagnose the problem. And by the time they reach specialists like Dr. Kwon at Massachusetts General Hospital, potentially lasting damage may have already taken place.

All orthopedic implants, regardless of their composition, shed debris as they wear. But researchers say they believe that the particles released by some all-metal hips pose a special threat because scavenger cells dispatched by the body to neutralize the debris convert it into biologically active metallic ions. In some patients, a chain reaction begins that can destroy tissue and muscle.