

Flotation Therapy: Rejuvenating the Body in a Body of Water

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***Professor R. H. Brian Costello
PhD FCP (Lond) Dip FAB Med Psych FAAIM FACFE MACE***

Zero Gravity Flotation Buoyancy

MUSCLES IN SPACE

Muscle Strengthening Water Skills

NASA Website Download

In the zero gravity of space, astronauts face many challenges. Chief among these is the effect of weightlessness on muscles. Even after spending as little as four or five days in space, astronauts have experienced significant muscle and bone changes.

The reason is that more than half the muscles in the human body are designed primarily to fight gravity. In a weightless environment, those muscles are not used. As a result, they quickly weaken and atrophy or waste away. Without the stress of pumping blood through the body against the force of gravity, the muscles of the heart also begin to weaken considerably.

Exercising during space flights is one way astronauts have tried to counter the effects of zero gravity. Unfortunately, they have had to exercise two to three hours a day just to maintain muscle and cardiovascular strength. The National Aeronautics and Space Administration (NASA) and research centers are currently working to develop exercising devices that recreate the forces on Earth so astronauts can spend more time exploring instead of exercising.

When a muscle fiber contracts, it does so completely and always produces the same amount of pull (tension). The muscle fiber is either "on" or "off." This is known as the all-or-nothing principle of muscle contraction. While this principle applies to individual muscle fibers, it does not apply to entire muscles. A muscle would be useless if it could only contract completely or not at all. The amount of tension or pull in a muscle can vary depending on how many muscle fibers in that muscle are stimulated to contract.