

Question for doctor:

How can you make blood flow more uniformly throughout the body?

Artificial gravity:

- It is possible to create “artificial” gravity in space by spinning the spacecraft or space station, but it still is very hard.
- Artificial gravity would reduce the effects of bone and muscle loss in space. It would also help fluids travel throughout the body instead of just going to the top of the body.
- Scientists still do not know the effects of artificial gravity on the human body .
- If a space station is rotating very fast, the rotation might damage the inner ear. In order to create artificial gravity you must have strong centrifugal gravity while keeping low rotation speed which would require about 4 times the width of the ISS. Therefore, it would also be a cost problem.
- If there is inaccurate amount of rotation, dizziness could occur due to the Coriolis effect.
- The Coriolis effect is the apparent curvature of global winds, ocean currents, and everything else that moves freely across the Earth’s surface. The curvature is due to the rotation of the Earth on its axis
- Centrifugal means moving away from the center and centripetal means moving towards to the center

Acupressure:

- Acupressure – Application of pressure on specific body points by only using fingers
- Might be used to treat bone and muscle loss (Muscles are important because the heart consists of cardio muscles; therefore, they relates to our topic.)

Blood pressure:

- **Blood pressure** is a [measurement](#) used in [medicine](#). In the body, the [arteries](#) carry blood away from the [heart](#). As blood travels through the arteries, it presses against the walls of the arteries. Blood [pressure](#) measures how hard the blood is pushing against the walls of the arteries.
- For healthy adult humans, the systolic blood pressure should be below 120, and the diastolic blood pressure should be below 80. However, blood pressure can be very different for each person. Blood pressure also changes naturally during the day (in a [circadian rhythm](#)). It gets lower during sleep and gets higher when a person gets up. It is lower when a person is resting and higher during activity.
- Blood pressure sensors are better used if they are on the upper arm than on the wrist because the arteries on the wrist are not as deep under your skin than those on the upper arm.
- Results showed that the Fitbit Charge 2 underestimates the heart rate.
- Astronauts experience low blood pressure when returning from space to earth. This condition is called orthostatic hypotension.
- The cuff is inflated to 20 mm Hg above systolic pressure allowing 0 blood to pass through. As the cuff deflates, blood can pass through which creates a vibration against the artery wall. The vibrations are transferred from the arterial wall, through the air inside the cuff, into a transducer in the monitor that converts the measurements into electrical signals.

Rubber pants

- The Russian Chibis suit is designed to counteract the tendency for fluids to pool in the upper body by applying lower body negative pressure (LBNP). Chibis works like a household vacuum

cleaner to suck astronauts into the pants, load the bottoms of their feet, and expand veins and tissues of the lower body.

- Rubber pants are like a vacuum allowing blood pressure to go to the feet instead of the head like Chibis.
- It could also improve an astronaut's vision.

Magnetic therapy:

- Magnetic field therapy uses different kinds of magnets on the body to help boost your overall health. It may also help treat certain conditions.
- NASA concluded that the astronaut's illness after they returned to earth was the lack of a magnetic field, so NASA placed magnets in space suits and astronauts have returned more healthy ever since

My solution:

Astronauts should have a heart monitor in their heart. When there is not enough blood in the lower body, cuff start to inflate near the legs which is similar to rubber pants. An alarm will also sound when there is not enough blood near the legs, so the astronauts know that they should exercise.

Websites:

1. <https://www.geek.com/news/geek-answers-why-doesnt-the-iss-have-artificial-gravity-1563351/>
2. <https://www.popularmechanics.com/space/rockets/a8965/why-dont-we-have-artificial-gravity-15425569/>
3. https://simple.wikipedia.org/wiki/Blood_pressure
4. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0192691>
5. <https://www.mayoclinic.org/diseases-conditions/high-blood-pressure/expert-answers/wrist-blood-pressure-monitors/faq-20057802>
6. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1121444/>
7. <https://www.universetoday.com/73828/what-is-the-coriolis-effect/>
8. https://blogs.nasa.gov/ISS_Science_Blog/2015/06/02/rubber-vacuum-pants-that-suck/

Coriolis effect picture:

