

Bed Rest Study "Cocktail" (2017)



For the purposes of space-related medical research, ten male volunteers are taking part in an extraordinary experiment at the MEDES Space Clinic: **simulating and studying the effects of weightlessness on the human body!**

Called "Cocktail," the study is sponsored by CNES and ESA. It will last 3 months (including 60 days in bed) and take place over 2 campaigns, each involving 10 volunteers: from January to April and then from September to December 2017.

The aim of the study is to simulate **conditions similar to those on manned space flights** in order to test a prevention method intended to mitigate the adverse effects of weightlessness on the human body and prepare astronauts for their return to Earth.

This method consists of an antioxidant and anti-inflammatory food supplement (a mixture of natural polyphenolic extracts from edible plants) that the volunteers will have to take several times a day in the form of capsules. Half of the volunteers will take the food supplement and the other half will be used as a control group, which does not therefore take the cocktail of capsules.

16 European scientific teams are taking part in the experiment. They are interested in studying the changes induced by bed rest and the effects of the prevention method, which will

be tested in the following areas: the metabolism, the cardiovascular system, muscles, bones, immunology, the neurosensory system and sleep.



The study lasts 3 months and takes place in 3 phases:

- * **15 days of measurements** on each volunteer before the bed rest
- * **2 months of anti-orthostatic bed rest tilted at -6° (the head lower than the feet)**
- * **15 days of recovery** during which new post-bed-rest measurements are collected making it possible to study the effects on the body of bed rest and the counter-measures by comparing them with the measurements made before the bed rest.

While this research is very useful for advancing space research, it also valuable for medicine on Earth. Indeed, subjecting healthy subjects to long periods of immobilisation with no physical activity allows scientists to have a better understanding of certain diseases such as obesity, diabetes or osteoporosis.

Why have a -6° tilt during the bed rest?

After several decades of practical studies, it has been determined that a -6° tilt (feet slightly above the head) corresponds to what an astronaut's body experiences in a situation of weightlessness. This position causes the bodily fluids to move to the upper part of the body, as observed in space. This makes it possible to simulate weightlessness while keeping the subject's feet (almost) on Earth!

