Why do older men have lower blood volume?

You learn something new every day, or anyway I try to. In the course of researching something else I discovered a study that showed that older men have substantially lower blood volume than younger men.(1) But why do older men have lower blood volume?

Let’s look at the study, which was straightforward. The researchers compared seven healthy, non-obese older men, average age 66, with an equal number of healthy, non-obese younger men, average age 24, “carefully matched for body size and daily energy expenditure”.

The older men had higher body fat, 23% vs 17%, than the younger men. They also had much lower levels of cardiovascular fitness, as measured by VO2max, than the younger men. As we’ll see, this is important.

Then they measured their blood volume.

Absolute levels of blood volume were 24% lower in the older men, at ~4.7 liters, vs ~6.2 liters in the younger men.

This was due to a 21% lower plasma volume, and a 28% lower volume of red blood cells. Although none of the men, older or younger, were anemic, these numbers suggest that hemoglobin levels were lower in the older men, since the decrement in red cell volume was greater than the decrement in plasma volume. This could be due to lower testosterone levels.

So, a 24% lower blood volume in older men seems pretty serious, a much greater diminution than I would have guessed. Why would that be?

A second study provides at least part of the answer.(2)

This study did not compare older to younger men, but older men who performed regular endurance exercise (running) to older men who were sedentary. All the men were in the age range of 51 to 67.

The older men, masters class runners, had significantly higher plasma and red cell volume than the sedentary men, from 15 to 20% higher.

So, it appears that a large component, about 70% (since r=0.70) of the lower
blood volume in older men is due to a simple lack of fitness.

It wouldn’t surprise me if lower testosterone accounted for the rest.

Is lower blood volume an important correlate of aging? It looks like it’s more of a component of being out of shape. If an older man regularly engages in intense exercise, intense enough to raise his VO2max, as well as doing what he needs to do to keep testosterone levels up, whether through TRT, an aromatase inhibibitor, or weight training, then he should maintain the blood volume of a young man.

The moral of the story here is that much of what is considered to be “normal aging” is in reality a consequence of being sedentary and overweight. Stay active and lean, and you stave off many of the effects of normal aging.

One often reads in scientific studies that certain physiological effects are just normal aging. Insulin resistance and greater body fat percent are two commonly named as such. In reality they are consequences of becoming inactive. Or lazy.

“Normal aging” means that your body can’t maintain itself or recover from insults as well as when younger. It means becoming sicker; there’s no other way to say it.

Don’t succumb to those who say that something is normal “for your age”, or “it just happens, nothing you can do about it”. No, there’s lots to be done about most things that happen in age.