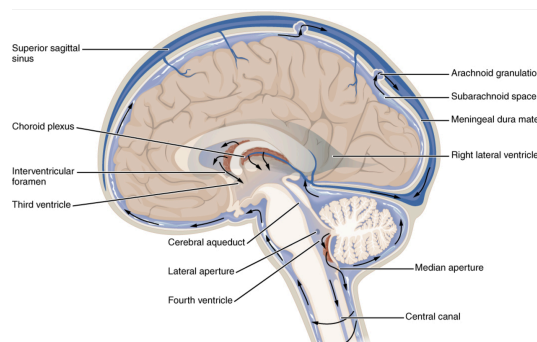

Jean-Charles Samuelian-Werve, 38, co-founder and CEO (of [neoinsurance](#) startup [Alan](#)), says without batting an eyelid that he “wants to revolutionize healthcare, so that everyone can live better, up to the age of 100”. [Le Soir 4 november 2024](#)

This month's theme: Fluid System and Aging

Our body is first made of water, but [the body water percentage decreases with age](#). Water is, of course, present in the fluids composing the body. The human fluid system, encompassing blood, lymph, and other bodily fluids, is crucial in maintaining homeostasis and overall health. As we age, several changes occur in these systems that will impact our health and well-being. Here's an overview of how the passing of time affects the human fluid system:



Blood Hemostasis and Coagulation

Increased Clotting Risk: Aging is associated with changes in the blood coagulation system, leading to an increased risk of thrombosis. This is due to higher levels of clotting factors and decreased natural anticoagulants. [A study shows that in the oldest old](#), cardiovascular risk factors can have different implications than in young adults. For example, high total cholesterol levels are linked to increased longevity because they are associated with lower mortality from cancer and infection.

Delayed Healing: Wound healing becomes slower in older adults due to impaired hemostasis and reduced cellular response. The incidence of chronic wounds increases with age, significantly affecting the quality of life in older adults. However, [the underlying biology of chronic wounds and the effects of age-related changes on wound healing are not well understood](#). Most research has relied on in vitro methods and various animal models, but the findings often need to be translated better into human healing conditions. One of the reasons for this situation is that older adults are often excluded from randomized clinical trials, leading to a need for more data.

Circulation

Arterial Stiffness: Arteries become stiffer with age, increasing blood pressure and the risk of cardiovascular diseases. As we get older, our large arteries undergo several consistent changes. The inside of the arteries becomes wider, the walls become thicker, and the

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arteries become less elastic. This happens because the constant pulsing of blood through these arteries over many years wears out and damages the elastic fibers in the artery walls. Additionally, older arteries tend to accumulate more calcium and the inner lining of the arteries (endothelium) doesn't work as well. These changes cause blood to travel faster through the arteries, leading to higher systolic blood pressure (the top number in a blood pressure reading) and a greater difference between systolic and diastolic pressure (pulse pressure).

The heart's ability to pump blood efficiently decreases with age, leading to reduced cardiac output and circulation. Other health problems like high blood pressure, metabolic syndrome, and diabetes worsen these age-related changes in the arteries. Aging arteries increase the risk of cardiovascular diseases such as atherosclerosis (hardening of the arteries), coronary artery disease, stroke, and heart failure. Managing high blood pressure and other risk factors can help slow down or reduce these changes in the arteries, improving overall heart health.

Lymphatic System

Impaired immune response decreased lymphocyte production: [One of the most notable signs of an aging immune system is a significant decrease in the number of naïve lymphocytes](#) (white blood cells) [in the blood](#). This decline occurs continuously as age advances, mainly due to reduced thymic output after puberty and inadequate peripheral maintenance. Lymphatic flow can slow down, reducing the efficiency of toxin and waste removal from tissues. Aging is an independent risk factor for the occurrence of some lymphatic-associated diseases. Lymphatic senescence, an important contributor to organ deterioration and failure, is associated with alterations in lymphatic structure and function, inflammatory and immune responses, as well as effects of chronic ultraviolet light exposure and oxidative stress.

Other Bodily Fluids

[Interstitial Fluid Edema](#): Aging can lead to fluid retention and edema, especially in the lower extremities, due to reduced mobility and changes in blood and lymphatic vessel function. Edema, characterized by fluid trapped in the body's tissues causing swelling, is common in the elderly and can significantly impact their quality of life. It often affects the arms, legs, hands, and feet, and can be caused by factors like physical inactivity, high salt intake, prolonged sitting, certain medications, and underlying health conditions such as heart, liver, or kidney disease. Recognizing symptoms like swelling, puffiness, aching joints, and decreased urine production is crucial. Edema can lead to serious complications if left untreated, including infections and blood clots. Proper management involves addressing the underlying causes, dietary adjustments, promoting physical activity, and possibly medical treatments like diuretics.

Cerebrospinal Fluid (CSF) Dynamics: The production and flow of cerebrospinal fluid changes with age, potentially affecting brain function and contributing to conditions like hydrocephalus. Studies have shown that aging [increases the levels of many proteins in](#)

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[cerebrospinal fluid \(CSF\)](#). As we age, the turnover of CSF slows down, which causes protein levels to rise due to concentration effects rather than specific diseases.

Possible new therapies and treatments

For thousands of years, [bloodletting](#) was thought to be a way to cure many if not most diseases. For decades, we also used the circulatory system to inject drugs and products into the body.

Recent advancements in understanding defects in the human fluid system, including lymphatic and vascular issues, have led to several promising therapies. Therapies promoting angiogenesis and lymphangiogenesis, like those targeting [vascular endothelial growth factor \(VEGF\)](#), help improve fluid drainage. Advanced diuretics and nanotechnology-based drug delivery systems enhance treatment efficacy and reduce side effects. Regenerative medicine, including tissue engineering and biomaterials, aims to restore fluid system function. Pharmacological chaperones and minimally invasive surgeries, such as [lymphaticovenular anastomosis \(LVA\)](#), provide additional solutions.

Maybe the most promising research concerns the [glymphatic drainage of cerebrospinal fluid](#) that could slow down Alzheimer's disease.

Together, these therapies hold promise for better managing fluid system disorders. Since fluids are everywhere in our bodies, new therapies could improve the whole patient's quality of life and health.

The good news of the month: The progress of the European Health Data Space and a Declaration for sharing health data

The European Union is creating a “European Health Data Space” (EHDS) where scientists will be able to use health data for research. This work is extremely useful, but sadly extremely slow. And only really available [data saves lives](#)! In Brussels, the participants of the [Eurosymposium on Healthy Ageing](#) adopted a [Declaration of Sharing Health Data and using AI for Healthy Longevity](#) insisting on accelerating progress.

For more information

- [Heales](#), [Longevity Escape Velocity Foundation](#), [International Longevity Alliance](#), [Longevity](#), and [Lifespan.io](#)
- [Heales Monthly Science News](#)
- [Heales YouTube channel](#)
- [Source of the image: Cerebrospinal fluid](#)
- [Contact us](#)