

## The HSA Lymphatic Nutrient Pump (HSALNP) and its Critical and Central Importance to Health

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### Abstract

The effectiveness of fluid therapy should be increased by infusion of human serum albumin (HSA) direct to the liver. HSA generation by the liver is the only factor available and capable of controlling whole body fluid volume levels and distribution. The remaining blood content blood cells, platelets, proteins are all controlled by other secondary mechanisms and follow the levels of albumin. Critical nutrients bind to HSA when HSA is made available by the liver. The HSA lymphatic pump circulates albumin through the interstitial spaces and lymph with a half-life of many hours. HSA levels may therefore have the ultimate control over all blood functions in healthy individuals and thus in the changes to nutrients and hormones transferred by the blood to the small cellular spaces. In the case of infected patients HSA binding deficiency may cause cellular deterioration and systemic sepsis. Infusing HSA to the liver should correct nutritional and colloidal pressure abnormalities in affected tissues.

**Keywords:** HSA Lymphatic Nutrient Pump (HSALNP); Human Serum Albumin (HSA); COVID-19

### Introduction

Multiple variants of COVID-19 have led to an increasing number of vaccines that have minimised reinfection levels but have little chance of eliminating COVID-19. Sustained COVID-19 infections encourage new variants some of which may be dangerous leaving pharmaceutical companies playing vaccine catch-up. Vaccines do not affect the virus directly but act to stimulate the body to produce antibodies.

A more pharmacological solution is to attenuate the body's own immune response by decreasing any known limiting factors to cell health, this must include systemically transported cell nutrients and hormones. We have shown that albumin binding of nutrients by the liver is one such limitation. Many people are asymptomatic or unaffected by COVID-19 and we have shown a common factor is the level of albumin available for binding and transporting essential nutrients. Cell health is a function of the surrounding medium, the nutrients in this medium are determined by human serum albumin (HSA) levels. Furthermore, albumin binding deficiency (ABD) is implicated in all vulnerabilities to COVID-19, e.g. age, obesity, nutrition.

### Human serum albumin lymphatic nutrient pump

The HSA lymphatic nutrient pump (HSALNP) [1] is critical as it defines the ability of the body to adjust to both posture, climate and pressure and its control is almost completely independent of the circulation of gaseous exchange, at the same time it controls resting cardiac pressure and cardiac output. It maintains the steady state of the cardiovascular system, immune system, cellular activity and responses to all administered drugs.

There is overwhelming evidence [1] that the circulation is not a singular concept as defined in conventional textbook physiology. There are quite clearly two or more circulations one for gaseous exchange (taking minutes) and another not controlled by the cardiac system, for nutrient distribution and waste removal (taking hours/days/weeks): this is controlled by combined colloidal pressure and the HSALNP from the liver and powered by body movement. Nutrients are maintained by the binding of HSA from all over the body but especially the liver, which is able to both produce and bind nutrients in 'real-time' without exhaustion, maintaining a consistent concentration of nutrients when the volumes of whole-body fluid (plasma, interstitial fluid lymph) change. These HSA-bound nutrients which critically circulate by posture, movement through the capillaries, interstitial fluid and lymph provide almost all nutrients to the organs according to individual physiology. The HSALNP forms a secondary circulation independent of the cardiac circulation which provides continuous monitoring of nutrient and waste status (nutrient bound HSA has higher colloidal pressure than waste bound) forming a natural homeostasis of nutrients, oncotic pressure in all organs individually and whole-body fluid composition. It is this circulation occurring over hours/days/weeks which forms the basis of acclimatisation due to pressure, altitude or depth.

As a simple example: posture, climate, and ambient pressure all contribute to the ability of the body to maintain cardiac return to the heart largely by means of the Frank-Starling mechanism. Cardiac output maintains both gaseous exchange and nutritional support through the HSALNP and both are critical in maintaining health. This cardio-respiratory circulation is not secondary as it is as essential as gaseous supply – and more critical when considering ill, obese or elderly individuals. Without a constancy of fluid volume and composition, the Frank-Starling mechanism operates inefficiently and failure results. The HSALNP defines the operating levels of the cardiac system over a longer time-period and the health of respective tissue and cellular structures according to HSA availability.

### Current fluid therapy protocols

The present applied protocols for Fluid therapy involving saline are dangerously uninformed, being based upon historical theory from the first world war without scientific merit, and should never be used longer than for immediate rehydration of the primary cardiac circulation. The only logical remedy is to add HSA to the liver directly. We predict this will raise oncotic pressure and nutrients in appropriate concentrations concurrently reducing and removing many, or all the symptoms, as previously described [2]. At present this is not the case and we believe many unnecessary lives are lost each day and many condemned to suffer due to the absence of an adequate understanding of integrative physiology.

### A more appropriate fluid therapy protocol

Here we propose that directly adding albumin to the liver via the hepatic portal vein to be charged with nutrients is the most appropriate protocol for fluid therapy. Peripheral infusion of both saline and colloid results in inappropriate nutrients and colloidal pressure. Infusing HSA direct to the liver should produce concomitant increase of bound HSA nutrients simultaneous with HSA concentration rise leading to a greater normalised whole blood volume, pressure and nutrients aligned to cellular efficiency. We consider that infusing saline peripherally is almost always contra-indicated in almost all cases where direct infusion of HSA to the liver is possible.

## **Conclusion**

There is a discontinuity between the science and mechanisms of medicine and practical application where this subject has been relegated to history inappropriately and without logic. All clinicians administering fluid therapy should be required to understand this highly complex but critical system as it is the central mechanism that defines the steady state health of the immune system, cellular integrity and whole-body fitness, particularly as albumin binding deficiency is also implicated in sepsis [3].

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