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Contractile physiology of lymphatics.

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The lymphatic system has important roles in body fluid regulation, macromolecular homeostasis, lipid absorption, and immune function. To accomplish these roles, lymphatics must move fluid and its other contents (macromolecules, lipids/chylomicra, immune cells) from the interstitium through the lymphatics, across the nodes, and into the great veins. Thus, the principal task of the lymphatic vascular system is transport. The body must impart energy to the lymph via pumping mechanisms to propel it along the lymphatic network and use pumps and valves to generate lymph flow and prevent its backflow. The lymphatic system utilizes both extrinsic pumps, which rely on the cyclical compression and expansion of lymphatics by surrounding tissue forces, and intrinsic pumps, which rely on the intrinsic rapid/phasic contractions of lymphatic muscle. The intrinsic lymph pump function can be modulated by neural, humoral, and physical factors. Generally, increased lymph pressure/stretch of the muscular lymphatics activates the intrinsic lymph pump, while increased lymph flow/shear in the muscular lymphatics can either activate or inhibit the intrinsic lymph pump depending on the pattern and magnitude of the flow. To regulate lymph transport, lymphatic pumping and resistance must be controlled. A better understanding of these mechanisms could provide the basis for the development of better diagnostic and treatment modalities for lymphatic dysfunction.

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