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# Restore renal function in chronic kidney disease by Hydro Pressure Therapy

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Chronic kidney disease is characterized by progressive loss of the renal microvasculature, which leads to local areas of hypoxia and induction of profibrotic responses, scarring and deterioration of renal function [1]. Revascularization alone might be sufficient to restore kidney function in a diseased kidney. For revascularization to be successful the underlying disease process needs to be halted or alleviated and there must remain a sufficient number of surviving nephron units that can serve as a scaffold for the kidney to regenerate [3].

The human body constantly regenerates after damage due to the self-renewing and differentiating properties of its resident stem cells. This natural process of healing replaces young cells having strong stress tolerance for tissue survival, which requires a functional vascular network at site [2]. Despite many recent advances in renal regenerative therapy, Chronic Kidney Disease (CKD) remains a major cause of morbidity and mortality. Whole organ regeneration may be a promising therapeutic approach. The role of a microenvironment in the pathogenesis of kidney disease has largely been undetermined. Microenvironment is a fundamental research topic in the fields of cell biology and regenerative medicine [4].

The possibility of using physical energies to boost regenerative processes has been strongly suggested and embedded in a wide variety of physical stimuli [5]. In renal fibrosis, a toxic microenvironment is unable to regenerate damaged renal tissue to restore kidney function. The use of physical energy in the form of hydrostatic pressure to eliminate renal fibrosis is a new therapeutic approach to restore renal function. A big advantage of hydrostatic pressure is its ability to increase circulation and assist venous return [6].

Pressure exerted by any liquid in a confined space is known as hydrostatic pressure, which acts equally in all directions, by the fluid molecules. When the body is immersed in fluid no movements are required. The urine collected in pelvis after artificial obstruction at pelviureteric junction will create intramural high hydrostatic pressure and helps to resolve renal fibrosis and to improve blood supply and recreates healthy cellular microenvironment which stimulates endogenous stem cells to regenerate hypoxic renal tissue structurally and functionally.

## Recent Publications

1. Huang, X., Das, R., Patel, A., & Duc Nguyen, T. (2018). Physical Stimulations for Bone and Cartilage Regeneration. Regenerative Engineering and Translational Medicine, 4, 216-237.
2. Facchin F, Bianconi E, Canaider S, Basoli V, Biava PM, Ventura C. Tissue Regeneration without Stem Cell Transplantation: Self-Healing Potential from Ancestral Chemistry and Physical Energies. Stem Cells Int. 2018 Jul 3;2018:7412035.
3. Singh, M., Berkland, C., & Detamore, M. S. (2008). Strategies and applications for incorporating physical and chemical signal gradients in tissue engineering. Tissue engineering. Part B, Reviews, 14(4), 341–366.

## Biography

Shrikant L Kulkarni completed his M.S. (General Surgery) in 1975 from B. J. Medical College Pune, Maharashtra India and his M.B.B.S. was completed at Miraj Medical College. Since 1971 he has worked at several government hospitals like the Wanless Hospital Miraj, Sangli General Hospital Sangli, Sassoon Hospital Pune, and multispecialty hospitals like Ruby Hall Clinic, Pune, and Jahangir Nursing Home, Pune. For the last 35-plus years, he is working at his own hospital at Chinchwad, Pune Maharashtra India.

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