Currently kidney transplantation is recognized as the best known treatment for end-stage renal disease. It is a procedure that improves the quality of life of dialyzed patients and their families, reduces treatment costs and the frequency of hospitalization. Despite the development of medicine, the problem of long waiting list for a kidney has not been eliminated. Kidneys from donors after cardiac death are more sensitive to ischemia reperfusion injury (IRI). Ischemic injury is related to renal blood flow arrest and can be divided into warm ischemia (WIT), pre-donation, and cold injury (CIT), associated with organ storage prior to surgery and implantation into the donor body. Restoring blood circulation in the kidneys after organ transplantation also leads to further damage, which is associated with the production of large amounts of reactive oxygen species (ROS). ROS damages the structure of the kidney, can activate enzymes that break down extracellular matrix proteins and affect the activity of of the immune system cells. Cold mechanical kidney perfusion has been reported to reduce the incidence of delayed graft function (DGF) and primary nonfunction of the kidney (PNF), compared to standard cold storage (kidney is immersed). The use of HMP also allows the addition of drugs that inhibit ROS production and kidney damage to the perfusion solution. The search for new components of the perfusion solution that will reduce the IRI associated damage caused by the increase ROS production and renal fibrosis may improve the quality and survival of the transplanted kidney. Mitoquinone (MitoQ) is an antioxidant that acts directly on the mitochondria. Due to its chemical structure, it can easily cross the mitochondrial membrane and reduce the ROS produced. Due to the fact that mitochondria are the main source of reactive oxygen species, new generation antioxidants such as MitoQ seem to be better than previously used free radical scavengers. MitoQ is a drug which activity was tested in the Phase II clinical trials in the treatment of Parkinson's, and its effectiveness has been demonstrated in various models of ischemia-reperfusion injury. We want to demonstrate the protective effect of MitoQ as a new component of perfusion solution used in cold machine perfusion of the kidney. Its use would minimize damage of the transplanted organ and increase the pool of organs suitable for transplantation surgery.