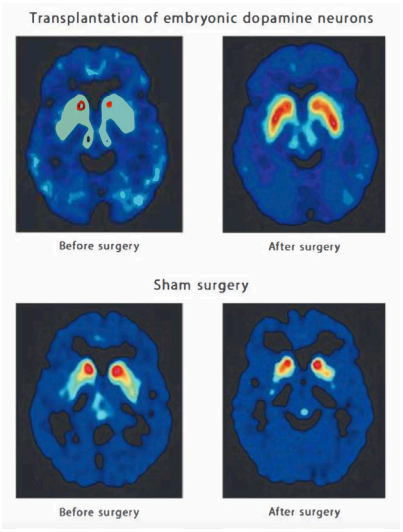
Freed et al (2001)

Freed et al (2001) studied the role of dopamine in Parkinson's disease. Parkinson's disease is a degenerative disorder that mainly affects the motor functions of the nervous system. The early symptoms of the disease are shaking, rigidity, and difficulty with movement and walking. Later in the development of the disease, thinking and behavioural problems also occur. Currently there is no cure for Parkinson's disease and the exact causes are unknown. In the study by Freed et al, the sample consisted of 40 patients who were 34-75 years old and had severe Parkinson's disease, with the mean duration of 14 years.

The sample was randomly divided into two groups: the experimental group received a transplant of nerve cells and the control group underwent sham surgery. In the transplant group, nerve tissue containing dopamine-producing neurons was taken from embryos aborted 7-8 weeks after conception and transplanted into the patients' putamen-a structure of the limbic system involved in movement regulation.



All surgeries were performed with the patient awake. Local anesthesia was administered to the skin of the forehead and four holes were drilled through the frontal bone, after which the tissue was transplanted through long needles. In the sham surgery group, holes were drilled in the skull but the dura (a thick membrane that surrounds the brain) was not penetrated. Otherwise, the procedure was identical. The results were that irrespective of the age group, PET scans revealed increased growth of dopamine producing cells in the putamen. Secondly, a reduction of symptoms by 28% was found in the patients in the transplant group, but only the younger ones (aged 60 or younger). No improvement was registered in the older sub- group of patients (aged over 60).

The overall conclusion was that transplantation of dopamine-producing neurons in the putamen of patients with severe Parkinson's disease results in some clinical benefit in younger but not older patients. Less response to treatment in the older patients despite successful growth of dopamine neurons may be attributed to lower neuroplasticity of the brain.