also randomly interleaved. When monkeys performed a trial correctly they received a drop of water as reward. Stimulation often interfered with the ability to produce accurate saccades. To avoid having monkeys no longer participate in the task we imposed a less restrictive criterion for accepting eye movements as correct for the stimulation trials compared to the no-stimulation trials. By 500ms after the cue to make a saccade appeared, the eye position had to be within 3º square around the target for non-stimulated trials. For stimulated trials the eye position had to be within 10º square around the target position.

Finally, electrical stimulation of the SNr was introduced at the time the fixation point was removed and continued for 400ms. The parameters of stimulation were 35-60μA, and 150μS pulse width. The train of electrical stimulation occurred on randomly interleaved trials. In separate blocks of trials, we used three different frequencies of stimulation, 75Hz, 125Hz and 300Hz. We used 300Hz at 61 sites in 3 monkeys, 75Hz at 21 sites in 2 monkeys and 125Hz at 11 sites of 2 monkeys. All three frequencies overlapped at 11 sites. We had clinically relevant parameters in mind when selecting these. For clinical use, typically between 100-130Hz stimulation is used in the subthalamic nucleus (Ashby et al. 1999). A Grass S88 dual output square wave pulse generator provided the input driving two PSIU6s (photoelectric stimulus isolation unit). These units in turn, each produced one phase of a biphasic pulse with constant current. For safety, these units are optically isolated (*Grass Technologies, AstroMed*). The pulses in the stimulation trains were current-balanced to minimize tissue damage. To ensure accurate current intensities, we measured the current before and after stimulation