Deep brain stimulation (DBS) was first introduced in 1987 by Benabid et al. targeting the VIM nucleus of the thalamus to treat Parkinson's disease (PD). Since that time, DBS has largely replaced ablative procedures for the treatment of hyperkinetic movement disorders. The dramatic shift in the surgical management of movement disorders has brought with it concerns regarding the safety of DBS surgery. Simultaneously, the number of centers offering DBS has proliferated dramatically and patients are increasingly referred to tertiary care centers complaining of suboptimal results. We present a retrospective analysis of adverse events (AEs) in 319 patients treated with DBS at our institution by one neurosurgeon (RS) from 1995-2005. To our knowledge, this is the largest and most diverse population of DBS patients reported from one center (Table 1).

Although a sizable number of patients experience some type of AE (43.3%), most DBS-related AEs, such as headache or confusion, are benign and transient (Table 2). Some patients, however, develop more serious AEs such as dysarthria, worsening gait, or cognitive dysfunction.

In our patient population, serious vascular events were uncommon, occurring in 5/319 (1.6%) patients: 2 ICH, 2 IVH, and 1 SDH. In large DBS patient populations, seizures are reported to occur in 0.9%-9.1% and infection in 3.7-6.5%. Our complication rates for these two AEs compare favorably: 1.2% and 4.4%, respectively.

One patient (0.3%) in this cohort committed suicide, a complication reported to be as frequent as 4.3%.

Previous investigators report a rate of 4.3-8.4% per electrode-year for hardware-related complications (lead fracture, lead migration, electrode dysfunction, and infections). Using similar methodology, our hardware-related complication rate is only 2.5% per electrode-year.

In our ten-year experience, DBS is safe for the treatment of medically-refractory movement disorders.