following each treatment. The most severe cognitive side effects are observed in the postictal period. Immediately after seizure induction, patients experience a variable but usually brief period of disorientation with impairments in attention, praxis, and memory (Sackeim 1986). These deficits recede at variable rates over time. Consequently, the magnitude of deficits observed during the course of ECT is a function, in part, of the time of assessment relative to the last treatment as well as the number of treatments received (Daniel and Crovitz 1983a; Squire et al. 1985).

Second, the methods used in ECT administration have a profound impact on the nature and magnitude of cognitive deficits. For example, ECT treatment technique is a major determinant of the percentage of patients who develop delirium characterized by continuous disorientation (Daniel and Crovitz 1986; Miller et al. 1986; Sackeim et al. 1986, 1993). In general, as summarized in Table 5–1, bilateral electrode placement, sine wave stimulation, high electrical dosage relative to seizure threshold, closely spaced treatments, larger numbers of treatments, and high dosage of barbiturate anesthetic agents are each independently associated with more intense cognitive side effects compared with right unilateral electrode placement, brief pulse waveform, lower electrical intensity, more widely spaced treatments, fewer treatments, and lower dosage of barbiturate anesthesia (Lerer et al. 1995; Lisanby et al. 2000; McElhiney et al. 1995; Miller et al. 1985; Sackeim et al. 1986, 1993, 2000; Weiner et al. 1986b). Optimization of these parameters can minimize short-term cognitive side effects and likely reduce the magnitude of long-term changes (Sackeim et al. 2000; Sobin et al. 1995). In patients who develop severe cognitive side effects such as delirium (Miller et al. 1986; Mulsant et al. 1991; Summers et al. 1979), the attending physician and ECT psychiatrist should review and adjust the treatment technique being used. Such modification may include switching to unilateral ECT, lowering the electrical dose administered, increasing the time interval between treatments and decreasing the dose, or discontinuing any medications that may exacerbate cognitive side effects.

Third, patients vary considerably in the extent and severity of their cognitive side effects following ECT. Available information about the factors that contribute to these individual differences is limited. Among depressed patients without known neurologic disease or insult, evidence has indicated that the extent of pre-ECT global cognitive impairment (as measured by Mini-Mental State Exam [MMSE] scores) predicts the magnitude of retrograde amnesia for autobiographic information at

Table 5–1. *Treatment factors that may increase or decrease the severity of adverse cognitive side effects*

Treatment factor	Associated with increased cognitive side effects	Steps to be taken to reduce cognitive side effects
Stimulus waveform	Sine wave	Change to brief pulse
Electrode placement	Bilateral	Change to right unilateral
Stimulus intensity	Grossly suprathreshold	Decrease electrical dose
Spacing of treatments	ECT administered 3–5 times per week	Decrease frequency or stop ECT
Number of seizures per session	Multiple (two or more) seizures per session	Change to a single seizure per session
Concomitant psychotropic medications	Lithium or agents with independent adverse cognitive effects	Reduce dose or stop psychotropics
Anesthetic medications	High dose may contribute to amnesia	Reduce dose as appropriate for light level of anesthesia