

Supplementary Online Content

Choi H, Sell RL, Lenert L, et al. Epilepsy surgery for pharmacoresistant temporal lobe epilepsy: a decision analysis. *JAMA*. 2008;300(21):2497-2506.

eAppendix. Literature Search

eFigure. Flow Diagram of Search and Selection of Studies

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In consultation with a medical librarian at Columbia University, we performed a systematic literature search of MEDLINE, the Cochrane Controlled Clinical Trials Register Database, and the Scientific Citation Index (1966 – 4th week of June 2008). We also searched the bibliographies of original articles and review papers.

The following search terms were used: Epilepsy [MeSH], Temporal Lobe [MeSH], Seizures [MeSH], mesial temporal sclerosis[tw], Hippocampus [MeSH], Sclerosis [MeSH], hippocampal sclerosis [tw], Surgery [MeSH], amygdalohippocampectomy[tw], Anterior Temporal Lobectomy [MeSH], amygdalotomy[tw], temporal resection[tw], Treatment Outcome [MeSH], mortality [MeSH]. We entered citations into an electronic database using Endnote version 11 (Thomson ISI Research-Soft, Carlsbad, CA).

Our searches were restricted to full-length English-language articles published between July 1999 and June 2008, as the AAN Practice Parameter systematically reviewed papers published between 1990 and 1999. The following study inclusion criteria were used: 1) studies with >30 patients undergoing temporal lobe resection, 2) seizure outcome reported using a standard outcome classification,²⁵ 3) if other types of epilepsy surgeries besides temporal lobe surgery were performed, a description of the types of surgeries and of the specific seizure outcome for each type of surgeries. Exclusion criteria

were as follows: 1) studies with patients limited to a specific etiology of temporal lobe epilepsy, 2) studies exclusively examining pediatric patients, 3) review articles without primary data, 4) cross-sectional data, 5) absence of reported seizure outcomes at year 1, or of reported outcomes for later years in those with or without seizures at year 1. eFigure 1 displays graphically our literature search.

Quality of Life Assessment

This study was approved by the institutional review board at Columbia University. Invitation letters were sent to all patients who had a temporal lobe resection at the Columbia Epilepsy Center between 2000 and 2006. Those who demonstrated interest were given an appointment. During a semi-structured in-person interview, a trained researcher elicited preference-based quality of life scores using iMPACT4,⁶⁸ interactive graphical software. The interview consisted of two parts. During the first part (training component), two clinical examples (i.e. wearing eyeglasses and being blind) were used to detect task comprehension. All who rated the quality of life of being blind as higher than wearing glasses on the standard gamble metric were excluded. In the second part, using the standard gamble, patients assessed their quality of life rating for eight different health states that might ensue with or without temporal lobe resection.

The health state descriptions were designed by a team consisting of preference-based quality of life assessment expert (L.L.) and three epilepsy clinicians (H.C., F.G., W.A.H.). Subsequently, three patients with prior temporal lobe resections reviewed the content for clarity. For readability, health states were described in an outline format with bullets. Because adverse effects from medications comprise a major concern of epilepsy patients and correlates highly with quality of life, health states with persistent seizure (whether after surgical or medical treatment) mention the presence of polypharmacy and medication adverse effects. The eight health states included:

- 1) freedom from disabling seizures with no surgical complications after temporal lobe resection,
- 2) persistent seizures despite temporal lobe resection with no surgical complications,
- 3) freedom from disabling seizures with transient complication after temporal lobe resection,
- 4) persistent seizures despite temporal lobe resection and with transient complication,
- 5) freedom from disabling seizures with permanent complication after temporal lobe resection,
- 6) persistent seizures despite temporal lobe resection and with permanent complication,
- 7) freedom from disabling seizures on continued medical management,
- and 8) persistent seizures despite continued medical management.

Life of a hypothetical patient with pharmaco-resistant temporal lobe epilepsy was highlighted using information about the various seizure types, use of multiple antiepileptic medications, and medication adverse effects such as concentration problem and dizziness. Based on the results of a study

examining important concerns of epilepsy patients, we also described the psychosocial impact of frequent seizures on the patient (e.g. feeling of dependence and anxiety caused by inability to drive and worry about the next seizure).⁴⁸ For health states following surgical treatment, the description mentions the use of general anesthesia, typical length of the procedure, expected duration of postoperative pain control, and duration of recovery process. For health states with freedom from disabling seizures, the description includes the ability to drive again, leading to independence and less anxiety about seizures, and to decreased medication use, resulting in reduced adverse effects. For health states with persistent seizures, the description includes having their usual seizures, needing to take multiple medications, and being unable to drive. For health states with transient complication, the description involves possible infection at the surgical site, requiring prolonged use of intravenous antibiotic and resulting in delayed discharge from the hospital and prolonged recovery process at home. For health states with permanent complications, patients are described as having homonymous hemianopsia, which prevents reading, driving, and return to work.

After being shown a brief description of each health state, the patients were told to rank order the health states from best to worst. Standard gamble scores were then elicited for each intermediate health state compared with a chance of experiencing the best (perfect health) and the worst outcome (death). Patients were told to imagine living the rest of their lives in each of the

intermediate health states. They were then given a choice of remaining in that particular health state for the rest of their lives or accepting a hypothetical treatment with a certain amount of risk of immediate death. However, if they survived the hypothetical treatment, they would be restored to perfect health for the remainder of their life. The probability of dying or living in perfect health was then varied until patients were indifferent to living in the intermediate state of health and a chance of dying immediately or living in perfect health. The preference-based quality of life score was calculated as one minus this equilibrium probability of death (or equivalently, the equilibrium probability of living with perfect health). Thirty-six patients who had previously undergone temporal lobe epilepsy surgery completed our semi-structured interview for preference-based quality of life measures. The following criteria were used to exclude 14 patients who had inconsistent utility values: 1) having greater value for “transient complication, no seizures” versus “no complication, no seizures” or “on medical management, no seizures”, 2) having greater value for comparable health states with “seizures” versus health states with “no seizures”, with the exception of “permanent complication.”

eFigure. Flow Diagram of Search and Selection of Studies

