**Antiepileptic drug treatment after an unprovoked first seizure: A decision analysis**

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**Supplemental Data**

**Appendix e-1**

**Calculation of utility of antiepileptic drug (AED) adverse effects**

The utility of AED adverse effects, *uSe*, was estimated to be 0.9 by extrapolation from a clinical study which compared Liverpool Adverse Effects Profile (LAEP) scores between first seizure patients who had taken AEDs and those who had not.1 The LAEP score is a validated systematic measure of adverse effects from AEDs. Because participants from both groups A and B used AEDs and were only divided by their duration of use, the mean global score from these two groups was calculated to capture the average effect of AED adverse effects, *LAEPAED*:

The mean LAEP score from Group C, consisting of patients who had not taken AEDs, was 35.8 (*LAEPno AED*). The relative difference between *LAEPAED* vs. *LAEPno AED* was:

This ratio was used to estimate *uSe*, the reduction in QOL due to AED adverse effects. As further support that this value is reasonable, we note that it is close to but slightly lower than the QOL value of 0.96 for the health state of *no recurrent seizures, AED treatment, no AED adverse effects*.2

**Calculation of death rate for non-seizure-free individuals**

The mean standardized mortality ratio for patients with ongoing seizures despite medical management is 5.40.2 This increased mortality ratio factors in deaths due to sudden unexpected death in epilepsy as well as other epilepsy-related causes of death including seizure-induced accidents, status epilepticus, and suicide.

The mortality ratio is related to the death rate by , where *x* is age in years, *r(x)* is death rate at age *x*, *R(x)* is adjusted death rate at age *x* due to illness, and is the time step.3 We used a time step of = 1 year. The death rate *r(x)* is related to *pDie* – the probability of dying between ages *x* and *x+1* obtained from US life tables4 – by .

The adjusted death rate, , was calculated from the mortality ratio value:

The adjusted probability of dying due to recurrent seizures, *pDieSz*, was obtained from the adjusted death rate by:

(table e-1).

Using *muASR* as the function to define , we obtain . Therefore:

(table e-1).

**References**

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