

Study characteristics

Reference

Abenstein, 2009⁹⁷

Health technology

BIS

Interventions and comparators

What interventions/strategies were included?

GA with BIS

Was a no treatment/supportive care strategy included?

GA without BIS

Research question

What are the stated objectives of the evaluation?

Are the changes in patient outcomes clinically relevant and if so are they cost-effective?

Study type: *cost-effectiveness/cost-utility/cost-benefit analysis?*

Cost-effectiveness

Study population

What definition was used for [condition]? What are the characteristics of the baseline cohort for the evaluation?

Not stated

Institutional setting: where is/are the intervention(s) being evaluated usually provided?

Not stated

Country/currency

Has a country setting been provided for the evaluation? What currency are costs expressed in and does the publication give the base year to which those costs relate?

USA, \$. Base year not stated

Funding source

Not stated

Analytical perspective

What is the perspective adopted for the evaluation (health service, health and Personal Social Services, third-party payer, societal (i.e. including costs borne by individuals and lost productivity)?

Not stated

Effectiveness

Were the effectiveness data derived from: a single study, a review/synthesis of previous studies or expert opinion? Give the definition of treatment effect used in the evaluation. Give the size of the treatment effect used in the evaluation

Effectiveness data derived from several studies

All patients:

Incidence of awareness episodes (Ekman): 18/10,000 procedures (GA); 4/10,000 procedures (GA with BIS)

High-risk patients:

Incidence of awareness episodes (Myles/Avidan): 59/10,000 procedures (GA); 18/10,000 procedures (GA with BIS)

Intervention costs

Were the cost data derived from: a single (observational) study, a review/synthesis of previous studies expert opinion? Were the methods for deriving these data adequately described (give sources if using data from other published studies)? List the direct intervention costs and other direct costs used in the evaluation – include resource estimates (and sources for these estimates, if appropriate) as well as sources for unit costs used.

Sources of intervention costs not stated

BIS monitor US\$9000

Cost of each BIS electrode sensor was US\$17

indicate the source for individual cost values (if appropriate)

Indirect costs (costs due to lost productivity, unpaid inputs to patient care)

Were indirect costs included?

Not applicable

Health state valuations/utilities (if study uses quality-of-life adjustments to outcomes)

Were the utility data derived from: a single (observational) study, a review/synthesis of previous studies expert opinion? Were the methods for deriving these data adequately described (give sources if using data from other published studies)?

Not applicable

List the utility values used in the evaluation

Not applicable

Indicate the source for individual cost values (if appropriate)

Modelling

If a model was used, describe the type of model used (e.g. Markov state transition model, discrete event simulation). Was this a newly developed model or was it adapted from a previously reported model? If an adaptation, give the source of the original. What was the purpose of the model (i.e. why was a model required in this evaluation)? What are the main components of the model (e.g. health states within a Markov model)? Are sources for assumptions over model structure (e.g. allowable transitions) reported – list them if reported.

Simple calculation

Extract transition probabilities for [natural history/disease progression] model and show sources (or refer to table in text).

Not applicable

What is the model time horizon?

Not applicable

What, if any, discount rates have been applied in the model? Same rate for costs and outcomes?

Not applicable

Results/analysis

What measure(s) of benefit were reported in the evaluation?

Cost per awareness episode avoided

Provide a summary of the clinical outcome/benefits estimated for each intervention/strategy assessed in the evaluation.

See above section on intervention costs

Provide a summary of the costs estimated for each intervention/strategy assessed in the evaluation.

Cost of monitor estimated by assuming 7 years use, monitor will be used on four patients per day, 300 days per year, i.e. US\$1.07 per patient

Thus cost of BIS monitoring is US\$18.07 per patient

Synthesis of costs and benefits – are the costs and outcomes reported together (e.g. as cost-effectiveness ratios)? If so, provide a summary of the results.

The associated cost of preventing each episode of awareness is US\$11,294 for all patients. The associated cost of preventing each episode of awareness is US\$4410 for high-risk patients.

Give results of any statistical analysis of the results of the evaluation.

None

Was any sensitivity analysis performed – if yes, what type(s) (i.e. deterministic (one-way, two-way, etc. or probabilistic).

No

What scenarios were tested in the sensitivity analysis? How do these relate to structural uncertainty (testing assumptions over model structure such as relationships between health states), methodological uncertainty (such as choices of discount rate or inclusion of indirect costs) or parameter uncertainty (assumptions over values of parameters in the model, such as costs, QoL or disease progression rates)?

None

Give a summary of the results of the sensitivity analysis – did they differ substantially from the base-case analysis. If so, what were the suggested causes?

Not applicable

Conclusions/implications

Give a brief summary of the author's conclusions from their analysis

General use of BIS monitoring does not seem warranted and appears not to be cost-effective

What are the implications of the evaluation for practice?

Not stated

SHTAC commentary

This study is a simple calculation and may not contain all relevant parameters. As such the economic evaluation is of poor quality.

Critical appraisal checklist of economic evaluation (Questions in this checklist based on Philips *et al.*³⁷)

Item	Abenstein	Comments
1 Is there a clear statement of the decision problem?	Y	Are the clinical advantages of BIS monitoring ... clinically relevant and cost-effective?
2 Is the comparator routinely used in UK NHS?	Y	
3 Is the patient group in the study similar to those of interest in UK NHS?	Y	
4 Is the health-care system comparable to UK?	Y	
5 Is the setting comparable to the UK?	Y	
6 Is the perspective of the model clearly stated?	N	
7 Is the study type appropriate?	Y	
8 Is the modelling methodology appropriate?	Y	
9 Is the model structure described and does it reflect the disease process?	Y	
10 Are assumptions about model structure listed and justified?	N	
11 Are the data inputs for the model described and justified?	?	Unclear where the costs are from
12 Is the effectiveness of the intervention established based on a systematic review?	N	
13 Are health benefits measured in QALYs?	N	
14 Are health benefits measured using a standardised and validated generic instrument?	N	
15 Are the resource costs described and justified?	?	Unclear where the costs are from
16 Have the costs and outcomes been discounted?	N	
17 Has uncertainty been assessed?	N	
18 Has the model been validated?	N	

Y, Yes; N, No; ?; unclear.