Implantable loop recorders are cost-effective when used to investigate transient loss of consciousness which is either suspected to be arrhythmic or remains unexplained

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Aims
To assess the cost-effectiveness of implantable loop recorders (ILRs) in people with transient loss of consciousness (TLoC), which, after initial assessment and specialist cardiovascular assessment, is either suspected to be arrhythmic in origin or remains unexplained. This analysis was conducted to inform clinical guideline recommendations made by the National Institute for Health and Clinical Excellence (NICE) on the management of TLoC.

Methods and results
Decision analytic modelling was used to estimate the costs and benefits of using ILRs compared with a strategy of no further diagnostic testing. Diagnostic outcomes were estimated from a systematic review and used to populate a decision tree model. To capture the main consequences of diagnosis, the costs and benefits of treatment for several clinically significant arrhythmias were estimated within the model. We used a cost-utility approach, in which benefits are measured using quality adjusted life years (QALYs), and took a UK National Health Service (NHS) and personal social services perspective. The cost per QALY was £17 400 in patients with unexplained syncope and £16 400 in patients with suspected arrhythmic syncope. Sensitivity analysis found that the cost-effectiveness estimates are fairly robust despite the areas of uncertainty identified in the evidence and assumptions used to inform the model.

Conclusions
Implantable loop recorder monitoring is likely to be a cost-effective strategy in people presenting to the UK NHS who are experiencing infrequent episodes of TLoC which either remain unexplained or are suspected to be arrhythmic after initial assessment and specialist cardiovascular assessment. Implantable loop recorder monitoring has been recommended by NICE for these populations.

Keywords
Transient loss of consciousness • Syncope • Implantable loop recorder • Diagnostic test • Cost-effectiveness • Decision analytic model

Introduction
Implantable loop recorders (ILRs) provide clinically useful documentation of heart rate and rhythm at the time of episodes of transient loss of consciousness (TLoC), but evidence is needed on their cost-effectiveness. Transient loss of consciousness is a common symptom affecting up to half the UK population over their lifetime.1 Many people remain undiagnosed after initial assessment by their emergency department or primary care physician and are then referred for specialist assessment.2,3 Most episodes of TLoC have a cardiovascular cause (syncope).4 Cardiac arrhythmia is a serious, but not particularly common, cause of syncope3 and the gold standard diagnostic test is an ECG recorded at the time of spontaneous syncope.4 This is because an arrhythmia may be present at the time of syncope but not afterwards. Implantable loop recorders have been recommended by the European...
Society of Cardiology (ESC) as a potentially useful means of obtaining symptom–electrocardiogram (ECG) correlation in patients experiencing infrequent syncopal attacks. The National Institute for Health and Clinical Excellence (NICE), which develops guidance for the UK National Health Service (NHS), has developed a clinical guideline on the management of TLoC in adults and young people. Determining appropriate diagnostic tests for people with TLoC was a key aspect of the guideline’s scope. The NICE guideline development group, which was tasked with formulating the guideline’s recommendations, wanted to assess whether ILRs should be used in people with infrequent episodes of TLoC (less than once every 2 weeks), which after initial assessment and specialist cardiovascular assessment, are either unexplained or suspected to be arrhythmic in origin. In the guideline, initial assessment consists of obtaining a detailed history, conducting a physical examination, and recording a 12-lead ECG. Patients are then referred for specialist cardiovascular assessment unless initial assessment provides a clear diagnosis of situational syncope, orthostatic hypotension or an uncomplicated faint, or unless the presentation is strongly suggestive of epilepsy. Specialist cardiovascular assessment begins with reassessment of the history, physical examination, and a repeat 12-lead ECG. Further diagnostic testing is then directed by the suspected cause of TLoC which can be: structural heart disease, arrhythmic syncope, neurally mediated syncope, or unexplained TLoC. Full details of the diagnostic algorithm are available in the guideline. Implantable loop recorders were considered to be potentially useful in people with infrequent episodes of TLoC that are either suspected to be arrhythmic syncope or remain unexplained at this point in the diagnostic pathway. Other forms of ambulatory ECG, such as external event recorders and Holter monitoring, were not considered to be suitable alternatives in patients with infrequent episodes due to the low probability of TLoC occurring during monitoring. The guideline development group felt that if an ILR was not used in this situation, the most relevant alternative strategy was continued clinical observation, with no further diagnostic tests.

The National Institute for Health and Clinical Excellence is required to consider the balance of costs and benefits when making recommendations. As ILR monitoring is a costly intervention, NICE required evidence on the cost-effectiveness of ILRs in a UK setting to inform their guideline recommendations. Therefore, we developed a decision analytic model to assess the cost-effectiveness of ILRs in this setting.

**Methods**

**Model overview**

The cost-effectiveness model reported here compares ILR monitoring vs. no further testing in patients with infrequent TLoC episodes, which are either unexplained or suspected to be arrhythmic in origin. This population excludes those who have suspected neurally mediated syncope or suspected structural heart disease after initial assessment and specialist cardiovascular assessment. The model uses a decision tree structure, as shown in Figure 1, to estimate the diagnostic outcomes from each strategy. In order to capture the main consequences of diagnostic strategy choice, the model considers whether an arrhythmia is recorded, or if no TLoC or ECG recorded. The model also considers whether ILR monitoring is used. Full details of the decision tree structure are shown in Figure 1.

**Figure 1** Decision tree structure (probabilities $P_1$–$P_4$ are defined in Table 2).
of diagnosis, the model also estimates the costs and benefits of treatment for several clinically significant arrhythmias. In line with NICE’s methods, we used a cost-utility approach, in which benefits are measured using quality adjusted life years (QALYs), and took a UK NHS and personal social services perspective. Costs and QALYs were discounted at 3.5%.

Costs of testing

The cost of ILR monitoring was based on NHS reference costs for implantation and removal when conducted as day case procedures. The device cost was based on a published estimate from 2004 which was uplifted to 2008 prices using the Hospital and Community Services Pay and Prices Index. Unit costs applied in the model are summarized in Table 1.

Table 1 Unit costs

| Description                  | HRG code | Midpoint | Interquartile range |
|------------------------------|----------|----------|---------------------|
| ILR monitoring               |          |          |                     |
| Implantation                 | EA03Z    | £1895    | £1160–£2564         |
| Removal                      | EA47Z    | £526     | £347–£575           |
| Device acquisition           | NA       | £1600    | NA                  |
| Pacing                       |          |          |                     |
| Implantation                 | EA05Z    | £2430    | £1352–£3762         |
| Device acquisition including leads | NA   | £1882    | NA                  |
| Annual follow-up             | 320      | £105     | £75–£122            |
| Costs following recurrence   |          |          |                     |
| Ambulance call-out (Category A) | PS31A | £208     | £176–£229           |
| Emergency Department attendance | VB07Z | £134     | £111–£161           |
| Admission                    | EB08I    | £318     | £237–£365           |

*Health Resource Group for reference cost.

Day case procedure.

Consultant-led non-admitted face-to-face follow-up appointment in cardiology.

Category 2 investigation and treatment without admission.

Table 2 Diagnostic event rates for implantable loop recorder used to populate the decision tree model

| Population                  | Number of studies | Probability of TLoC, P1 | Probability of outcomes in patient having TLoC |
|-----------------------------|-------------------|-------------------------|-----------------------------------------------|
| Suspected arrhythmia        | 4                 | 133/253 = 0.53          | 78/133 = 0.59 Normal, P3 = 0.29                |
| Unexplained                 | 15                | 616/1102 = 0.56         | 300/616 = 0.49 No ECG recorded, P4 = 0.12    |

The diagnostic event rates derived from the systematic review are summarized in Table 2. The data from multiple studies were synthesized by averaging the event rates across the available studies. Figure 1 shows how the probabilities extracted from the systematic review are applied within the decision tree. For the no-testing strategy, we assumed that the rate of TLoC episodes is identical to that seen in the ILR monitoring strategy, but that no patient receives a diagnosis.

We restricted our analysis of outcomes following diagnosis to several key arrhythmias which were selected based on the potential impact of treatment on costs and QALYs. These were ventricular tachycardia (VT) and bradyarrhythmias due to either atrioventricular (AV) block or sick sinus syndrome (SSS). We assumed that patients diagnosed with AV block or SSS would receive a dual-chamber pacemaker, and that patients diagnosed with VT during syncope would receive an implantable cardioverter defibrillator (ICD). Post-diagnostic outcomes were modelled for all patients experiencing one of these three arrhythmias during TLoC. However, for patients who had an arrhythmia recorded during an asymptomatic period, we restricted our analysis to those arrhythmias considered to be of most clinical significance in the absence of TLoC: complete AV block, asystole lasting > 3 s, and sustained VT.

For all other patients, we made the simplifying assumption that diagnostic testing would have no significant impact on their future costs and health outcomes. This effectively ignores any change in patient management and outcomes that would result from observing a normal rate and rhythm during TLoC, an arrhythmia other than AV block, SSS or VT, or an absence of TLoC episodes during the lifetime.

Diagnostic inputs and assumptions

Diagnostic yield was assessed through a systematic review of the literature, full details of which are reported in the guideline. The review reported diagnostic yield rather than measures of diagnostic accuracy (sensitivity and specificity), as an ECG recorded during syncope is considered to be the gold standard diagnostic test for arrhythmic syncope. The diagnostic outcomes extracted by the systematic review and included in the model were as follows:

- Transient loss of consciousness with ECG showing normal rate and rhythm during TLoC.
- Transient loss of consciousness with ECG showing arrhythmia during TLoC.
- Transient loss of consciousness with no ECG recorded during TLoC (equipment failure).
- Arrhythmia recorded in the absence of TLoC (asymptomatic arrhythmia).
- No TLoC during ILR monitoring and no asymptomatic arrhythmia recorded.

The diagnostic event rates derived from the systematic review are summarized in Table 2. The data from multiple studies were synthesized by averaging the event rates across the available studies. Figure 1 shows how the probabilities extracted from the systematic review are applied within the decision tree. For the no-testing strategy, we assumed that the rate of TLoC episodes is identical to that seen in the ILR monitoring strategy, but that no patient receives a diagnosis.
Table 3: Event rates used to describe the distribution of arrhythmias

| Parameter                        | Event rate | Number of studies* |
|----------------------------------|------------|--------------------|
| Proportion of arrhythmias        |            |                    |
| during TLoC that are              |            |                    |
| bradyarrhythmias                 |            |                    |
| Proportion of bradyarrhythmias   |            |                    |
| during TLoC that are:            |            |                    |
| AV block                         | 106/279 = 0.38 | 20                 |
| SSS                              | 157/279 = 0.56 |                    |
| Other                            | 16/279 = 0.06 |                    |
| Proportion of tachyarrhythmias   |            |                    |
| during TLoC that are:            |            |                    |
| VT during syncope                | 38/141 = 0.27 | 27                 |
| Other                            | 103/141 = 0.73 |                    |
| Proportion of arrhythmias not    |            |                    |
| during TLoC that are:            |            |                    |
| bradyarrhythmias                 |            |                    |
| Proportion of bradyarrhythmias   |            |                    |
| not during TLoC that are:        |            |                    |
| Complete AV block                | 16/63 = 0.23 | 8                  |
| Asystole > 3 s                   | 44/63 = 0.64 |                    |
| Other                            | 9/63 = 0.13  |                    |
| Proportion of tachyarrhythmias   |            |                    |
| not during TLoC that are:        |            |                    |
| Sustained VT                     | 25/66 = 0.38 | 8                  |
| Other                            | 41/66 = 0.62 |                    |

*Not all studies included in the review had data on all events. Details of exact studies included can be found in Table 29 of the guideline.¹

Modelling outcomes following diagnosis

We relied on existing technology appraisals and targeted literature searches to identify evidence on the cost and benefits of treatment following diagnosis. A systematic review of all treatment outcomes was not considered feasible, because the treatment of arrhythmias was not within the scope of the guideline. We identified an existing economic evaluation of pacing in SSS and AV block, but it compared dual-chamber pacemakers to single-chamber pacemakers rather than comparing pacing to no treatment.¹ Similarly, an existing economic evaluation of ICD therapy in VT was identified, but it compared ICD therapy with anti-arrhythmic drug therapy.¹ Therefore, further supplementary evidence and assumptions were required to estimate the costs and health benefits of pacing and ICD therapy in diagnosed patients compared with no treatment in patients who remain undiagnosed.

Health-related quality-of-life (HRQoL) benefits were sought from a targeted review of studies in patients with TLoC caused by either syncope or epilepsy.¹ Only preference-based utility measures were included in the review. Evidence was identified on the utility gain of the device. This simplifying assumption will have underestimated the benefits of testing in these patients and this was considered when interpreting the cost-effectiveness results.

The event rates for the key arrhythmias included in the model were estimated by combining data across all the available studies included within the systematic review of ambulatory ECG. This review included studies that employed other forms of ambulatory ECG such as Holter monitoring and external event recorders.¹ The event rates of the different arrhythmias are summarized in Table 3.

In order to estimate the survival gain of pacing in SSS and AV block, we used data from the Devon Heart Block and Bradycardia Survey.¹² This cohort study measured survival in paced and unpaced patients with AV block and SSS observed on 12-lead ECG. The study showed no survival gain from pacing in SSS but some survival gain from pacing in AV block. In the latter group, survival estimates from this study were used to extrapolate life year gains over a 10-year period. The rates observed directly in the study were applied in the first 6 years and thereafter, the average mortality risk from years 4 to 6 for paced patients (6.9% per annum) was applied to both paced and unpaced patients. For patients with SSS a constant mortality rate (8.7% per annum), taken from the published appraisal,¹ was applied to both arms, such that there was no survival gain attributable to pacing. There was some uncertainty as to whether patients with transient AV block during syncope would be expected to have similar survival benefits from pacing to those with second-degree AV block on 12-lead ECG. In a sensitivity analysis, we considered the impact of assuming no survival gain in AV block by applying the same mortality risk as used in SSS to both paced and unpaced patients with AV block.

The TLoC recurrence rate for patients with SSS or AV block was taken from a randomized controlled trial (RCT) comparing pacing with no treatment in patients with SSS.¹⁴ The rate was 17% in years 1 and 2 for unpaced patients. In paced patients the rate was 6% in year 1 and 0% in year 2. We applied these rates in years 1 and 2 of the model and assumed no further recurrences thereafter. This may have underestimated the cost-effectiveness of diagnostic testing because preventing further recurrences would result in additional cost savings. Therefore, the impact of assuming that recurrences continue in unpaced patients at the same rate for 10 years was explored in a sensitivity analysis. These data on recurrence rates were also applied to patients with AV block as no suitable data were found for this population.

The cost of pacing and the cost of TLoC recurrence were based on NHS reference costs and estimates from the published appraisal. Costs of recurrence in patients with SSS or AV block were based on reference costs for an ambulance call out and attendance at an Emergency Department.⁸ Admission costs were not included as it was assumed that the majority of patients would not experience an injury requiring admission and would not require admission for further diagnostic investigation. In a sensitivity analysis, we considered the impact of including admission costs. To test the combined uncertainty regarding recurrence rates and costs of recurrence, we conducted a sensitivity analysis in which we assumed that unpaced patients experience one recurrence per annum and that recurrence always results in admission. Reference costs were used to estimate the cost of day case pacemaker implantation and annual follow-up appointments over a 10-year period.⁸ Admission for pacemaker implantation was considered in a sensitivity analysis as not all centres perform these procedures as day cases. Device costs were taken from the published technology appraisal.⁹ The treatment and recurrence costs applied are summarized in Table 1.

For VT causing syncope, estimates from the existing published appraisal,¹⁰ which compared ICD therapy with anti-arrhythmic drug therapy, were used as suitable data were not found for this population.
therapy, were adjusted to estimate the costs and QALY impact of ICD therapy relative to no treatment. Firstly, we assumed that the frequency of episodes would not be reduced by ICD therapy so the same costs were applied in the model for health care contacts resulting from syncope in both the ICD and no treatment arms. This may have underestimated the cost-effectiveness of ILR testing, if in fact ICD therapy or other treatments given to diagnosed patients are able to reduce the frequency of TLoC or the likelihood of injury during TLoC. Secondly, we assumed that the survival gain from ICD therapy compared with anti-arrhythmic therapy would be similar to the survival gain from ICD compared with no therapy. The QALY gains were then uplifted to reflect the potential for HRQoL improvement following diagnosis using the estimate obtained from our targeted review. As there was considerable uncertainty in this estimate, sensitivity analyses were conducted in which this HRQoL improvement was excluded. The cost of ICD implantation was adjusted to reflect the fact that day case implantation is more common now than at the time of the appraisal and monitoring costs were removed from the comparator arm to reflect the fact that monitoring costs are unlikely in undiagnosed patients not receiving anti-arrhythmic therapy.

Exploring uncertainty

Univariate sensitivity analyses were conducted to explore how sensitive the model results are to the various assumptions used to inform the model structure and to any uncertainties in the data used to populate the model. For each of the univariate sensitivity analyses, we changed a key assumption or data input and examined what impact this had on the cost-effectiveness results. We considered the impact of assuming no survival gain in paced patients, restricting costs and benefits after pacing to 6 years, applying inpatient rather than day case costs for pacemaker implantation, reducing the size of quality-of-life gain associated with pacemaker therapy and removing any quality-of-life gain for ICD therapy. We also considered three alternative scenarios for the costs savings associated with avoiding recurrences through pacing, and examined the impact of applying a lower cost for ILR devices.

It is also important to explore the precision around cost-effectiveness estimates, so we conducted a probabilistic sensitivity analysis. This looks at the variation in the cost-effectiveness outputs that arises from uncertainty surrounding the precision of the model inputs. Standard distributions were used to describe parameter uncertainty. Dirichlet distributions and beta functions were used to describe the uncertainty in the diagnostic yields and recurrence rates, beta distributions were used for utility estimates and gamma distributions were used for cost estimates. The following parameters were not made probabilistic: the list price for ILRs and pacemakers, the survival rates in AV block and SSS, the cost and QALY gains for ICD treatment compared with no treatment (except for the utility difference used to adjust the QALY gains) and the discounting rate for costs and benefits. The distributions used for each parameter can be found in Appendix I of the published guideline.

In a secondary analysis we considered a comparison of ILR against conventional testing for patients with unexplained syncope, because there were RCT data available for this comparison from a UK setting. The diagnostic event rates for this comparison were derived directly from the trial (see Table 28 of the guideline). The trial showed that hospitalization costs and diagnostic costs in the 6 months following randomization were £809 (95% CI £123–£2766) lower for patients randomized to receive ILR. The cost of ILR monitoring was therefore offset by this amount in the secondary analysis. Implantable loop recorder costs were excluded from the RCT's cost analysis and so had to be added separately in the model using the same methods applied in the base case comparison of ILR against no further testing.

Results

The model estimates that ILR monitoring results in additional diagnoses in both patient groups when compared with a strategy of no further testing (see Table 4). The ILR strategy resulted in 330 additional diagnoses of arrhythmia in patients with unexplained syncope, and 350 in people with suspected arrhythmic syncope, per 1000 patients tested. Sick sinus syndrome was the most commonly diagnosed arrhythmia followed by AV block.

These additional diagnoses are predicted by the model to result in QALY gains over the lifetime of the cohort. In the unexplained syncope group, the overall QALY gain was 0.366 per patient tested with most of the QALY gain resulting from treating AV block. In the suspected arrhythmic syncope group, the overall QALY gain was 0.394 and similarly the majority of this resulted from treatment of AV block.

Implantable loop recorder monitoring is estimated to result in an overall increase in cost, as the cost of testing and providing treatment following diagnosis is not completely offset by reductions in syncope recurrence. The overall cost for ILR monitoring compared with no testing was £6384 and £6459 for the unexplained and suspected arrhythmic groups, respectively. The cost of the diagnostic testing itself was £4021 per patient in both groups. The average cost of treating patients following diagnosis was estimated as £2381 and £2457 per patient tested, for the unexplained and suspected arrhythmic groups, respectively. The cost

| Table 4 Incremental cost-effectiveness results (deterministic) |
|------------------|------------------|------------------|------------------|
| **Comparison** | **ILR vs. no testing** | **ILR vs. conventional testing** | **Unexplained arrhythmia** |
| **Population** | **Suspected arrhythmia** | **Unexplained arrhythmia** | **Unexplained arrhythmia** |
| Diagnostic outcomes per 1000 patients tested | | | |
| AV block | 91 | 83 | 44 |
| SSS | 141 | 131 | 65 |
| VT | 30 | 30 | 11 |
| Other arrhythmia | 88 | 86 | 37 |
| Arrhythmia excluded | 154 | 250 | 197 |
| Economic outcomes per patient tested | | | |
| Cost | £6460 | £6380 | £4220 |
| QALYs gained | 0.394 | 0.366 | 0.181 |
| Cost per QALY gained | £16390 | £17450 | £23360 |
savings from reduced recurrences were minimal at £18 and £20 per patient tested, respectively.

The incremental cost-effectiveness ratio (ICER) for ILR compared with no testing is estimated to be under £20 000 per QALY in both populations. The cost-effectiveness of ILR compared with no testing in patients with unexplained syncope is estimated at £17 400 per QALY. For patients with suspected arrhythmic syncope, the cost-effectiveness is estimated at £16 400 per QALY. The base case cost-effectiveness results from the simple deterministic model, in which all model inputs are fixed at their midpoint value, are summarized in Table 4.

The probabilistic sensitivity analysis showed that ILR monitoring is likely to be cost-effective in both patient groups compared with no testing, given our current uncertainty regarding the model inputs. The range of costs and benefits generated by the model can be seen in Figure 2. Despite the uncertainty regarding the expected costs and QALYs, the ICER had an 88% probability of being under £20 000 per QALY for unexplained syncope and a 94% probability for suspected arrhythmic syncope.

The univariate sensitivity analysis found that the cost-effectiveness of ILR compared with no testing is fairly robust despite the areas of uncertainty identified in the evidence and assumptions used to inform the model. The ICER was sensitive to some of the assumptions used within the model, as can be seen from Figure 3. In particular, the ICER increased when we assumed no survival gain from pacing or lower HRQoL gain from either pacing or ICD therapy. It also increased when we restricted the cost and benefits of pacing to only 6 years, as the main effect of this was to reduce the duration of benefits achieved by pacing. The model was not particularly sensitive to alternative assumptions regarding the rate or cost of recurrences. Furthermore, it was not particularly sensitive to changes in the cost of pacemaker implantation or the acquisition cost of the ILR device.
None of the sensitivity analyses exploring the key areas of uncertainty increased the ICER to above £30 000 per QALY.

The secondary analysis of ILR vs. conventional testing in patients with unexplained TLoC, based on the diagnostic outcomes from a single RCT, had an ICER of £23 400 per QALY. In this analysis ILR was estimated to result in only 56 diagnoses of AV block, 82 of SSS, and 14 of VT per 1000 patients tested. The conventional testing approach used in the RCT was estimated to result in 12 diagnoses of AV block, 17 of SSS, and 3 of VT per 1000 patients tested. The incremental cost was £4220 and the incremental QALY gain was 0.181.

Discussion

Our model showed that ILR monitoring is likely to be a cost-effective testing strategy in people presenting to the UK NHS who are experiencing infrequent episodes of TLoC which either remain unexplained or are suspected to be arrhythmic after initial assessment and specialist cardiovascular assessment. The model shows that ILR monitoring results in an increased rate of arrhythmia diagnosis, but at an additional cost. When forming guidance on the use of ILRs, NICE was required to consider whether the clinical benefits that result from these additional diagnoses are sufficient given the additional costs required to provide ILR. The National Institute for Health and Clinical Excellence does not apply a rigid cost-effectiveness threshold. Instead it considers that interventions with a most plausible ICER under £20 000 are unlikely to be rejected on the basis of cost-effectiveness and those with ICERs above this figure would need increasingly strong reasons to support their recommendation. It considers interventions with ICERs above £30 000 to be likely to be rejected on the basis of cost-effectiveness.5 Implantable loop recorder monitoring was therefore considered by the guideline development group to be cost-effective in both of the populations examined.

Our analysis had several limitations which were explored through sensitivity analysis. There was uncertainty as to whether pacing would have a similar impact on survival for patients with transient AV block identified by ILR, as compared with the patients who are experiencing infrequent events (more than once a month) and Holter monitoring in order to maximize the likelihood of documenting heart rate and rhythm on ECG during TLoC. The model reported here was also used to evaluate the cost-effectiveness of external event recorders in patients with fairly frequent events (more than once a month) and Holter monitoring in patients with very frequent events (more than once a week), and both were recommended as cost-effective in the guideline.1

One key difference between the NICE and ESC guidelines is that the ESC guidelines include a recommendation for using ILR in patients with suspected or certain reflex syncope, before embarking on cardiac pacing.3 This indication for ILR was also considered by the guideline development group, and a separate economic model was developed which compared ILR with tilt-testing using data from the ISSUE 2 study.20 Implantable loop recorder monitoring was not recommended in the NICE guideline, as tilt-testing was found to be more cost-effective than ILR monitoring as a means of directing pacing therapy for people with suspected neurally mediated syncope.

Our cost-effectiveness model was developed to inform NICE guidance on the use of ILR monitoring in patients with frequent TLoC episodes that are either unexplained or have a suspected arrhythmic cause after initial assessment and specialist cardiovascular assessment. The National Institute for Health and Clinical Excellence has recommended ILR monitoring in this population because it considers it to be a cost-effective use of NHS resources.

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