Meta-analysis summary: Prolonged cardiac rhythm monitoring and secondary stroke prevention

In patients with cryptogenic cerebral ischemia

As published in Stroke, June 2019

**Objective**
Evaluate the impact of prolonged cardiac rhythm monitoring (PCM) on secondary stroke prevention using data from available-to-date randomized clinical trials (RCTs) and observational studies.

**Results**
Patients who underwent PCM compared to conventional cardiac monitoring show:

- **2.5x increased incidence of AF detection**
  - (n = 1,102, RR = 2.46, 95% CI: 1.61-3.76, and p < 0.0001)

- **2.1x increased incidence of anticoagulant initiation**
  - (n = 956, RR = 2.07, 95% CI: 1.36-3.17, and p = 0.0008)

- **55% decreased risk of recurrent stroke**
  - (n = 1,102, RR = 0.45, 95% CI: 0.21-0.97, and p = 0.04)

**Conclusion**
The use of prolonged cardiac monitoring has a potential impact on secondary stroke prevention, as patients with cryptogenic IS (ischemic stroke)/TIA undergoing PCM had higher rates of AF detection, anticoagulant initiation, and lower stroke recurrence.

---

**Stroke definition**
The definition of the index events in available studies included cryptogenic stroke (CS) defined according to Trial of Org 10172 in Acute Stroke Treatment (TOAST) criteria in two studies, and embolic strokes of undetermined source (ESUS) in one study, and select IS patients (with no history of AF and no significant extracranial or intracranial arterial stenosis) in one study.

**Method**
A comprehensive literature search of MEDLINE, SCOPUS, CENTRAL, and conference proceedings was conducted to identify studies reporting stroke recurrence rates in patients with a history of cryptogenic stroke or TIA receiving PCM as compared to patients receiving conventional (non-PCM) cardiac monitoring. Literature search was performed on October 14, 2018.

**Identified records: 885**
Studies reporting stroke recurrence rates in patients with history of cryptogenic IS or transient ischemic attack (TIA) receiving PCM compared to patients receiving conventional (non-PCM). This includes:
- Randomized clinical trials (RCTs)
- Prospective-retrospective cohort studies
- Case-control studies

**Records excluded: 881**
- Duplicates, case reports, and case series
- Studies not reporting stroke recurrence rates during follow-up or not providing data for the reference group receiving non-PCM
- Studies providing data on AF detection rates and/or change in management (anticoagulant initiation) according to PCM results without providing data on stroke recurrence
- Studies not including IS/TIA population, control group, or report on IS/TIA recurrence

**Records included: 4**
The meta-analysis included two RCTs and two observational studies, for a total of 1,102 patients (mean age: 68 years, 41% women).
- Brown ESUS-AF
- CRYSTAL AF
- FIND-AF
- Rodríguez-Campello, et al.

**Study limitations**
- This analysis provides preliminary evidence for a potential impact of PCM on secondary stroke prevention.
- The data used is based on two RCTs and two observational studies.
- Prolonged cardiac monitoring consisted of insertable cardiac monitors (ICMs) in three of the studies (n = 704) and repeated Holter monitoring (n = 398) in one study (three periods of 10 days). As such, the results don’t exclusively pertain to ICMs, although patients with ICMs made up the majority of the cohort.
References


Brief Statement

**Medtronic LINQ Family Insertable Cardiac Monitor System (ICM) and Remote Monitoring**

**Indications**

The Reveal LINQ ICM is an insertable automatically-activated and patient-activated monitoring system that records subcutaneous ECG and is indicated in the following cases:

- patients with clinical syndromes or situations at increased risk of cardiac arrhythmias
- patients who experience transient symptoms such as dizziness, palpitation, syncope, and chest pain that may suggest a cardiac arrhythmia

This device has not been tested specifically for pediatric use.

The LINQ II ICM is an insertable automatically-activated and patient-activated monitoring system that records subcutaneous ECG and is indicated in adult patients, and in pediatric patients who are at least 2 years old, in the following cases:

- patients with clinical syndromes or situations at increased risk of cardiac arrhythmias
- patients who experience transient symptoms such as dizziness, palpitation, syncope, and chest pain that may suggest a cardiac arrhythmia

**Contraindications**

There are no known contraindications for the insertion of the LINQ Family ICMs or their accessories. However, the patient’s particular medical condition may dictate whether or not a subcutaneous, chronically inserted device can be tolerated.

**Warnings and Precautions**

Patients with a LINQ Family ICM should avoid sources of diathermy, high sources of radiation, electrosurgical cautery, external defibrillation, lithotripsy, therapeutic ultrasound and radiofrequency ablation to avoid electrical reset of the device, and/or inappropriate sensing as described in the Medical procedure and EMI Warnings, Precautions and Guidance Manual. MRI scans should be performed only in a specified MR environment under specified conditions as described in the LINQ II or Reveal LINQ ICM MRI Technical Manual.

Wireless accessories available for use with a LINQ Family ICM may experience connectivity or performance issues. See product manuals for details and troubleshooting instructions.

**Potential Adverse Events**

Potential adverse events from the LINQ Family ICM include, but are not limited to, device rejection phenomena (including local tissue reaction), device migration, infection, and erosion through the skin.

There are no known adverse events associated with the use of any LINQ Family ICM wireless accessories.

See the device manuals for detailed information regarding the implant procedure, indications / intended use, contraindications, warnings, precautions, and potential complications/adverse events. For further information, please call Medtronic at (800) 328-2518 (Technical Services), (800) 551-5544 (Patient Services), and/or consult Medtronic’s website at www.medtronic.com.

**Caution:** Federal law (USA) restricts prescription devices to sale by or on the order of a physician.