

CARING FOR OUR CRYPTOGENIC STROKE PATIENTS

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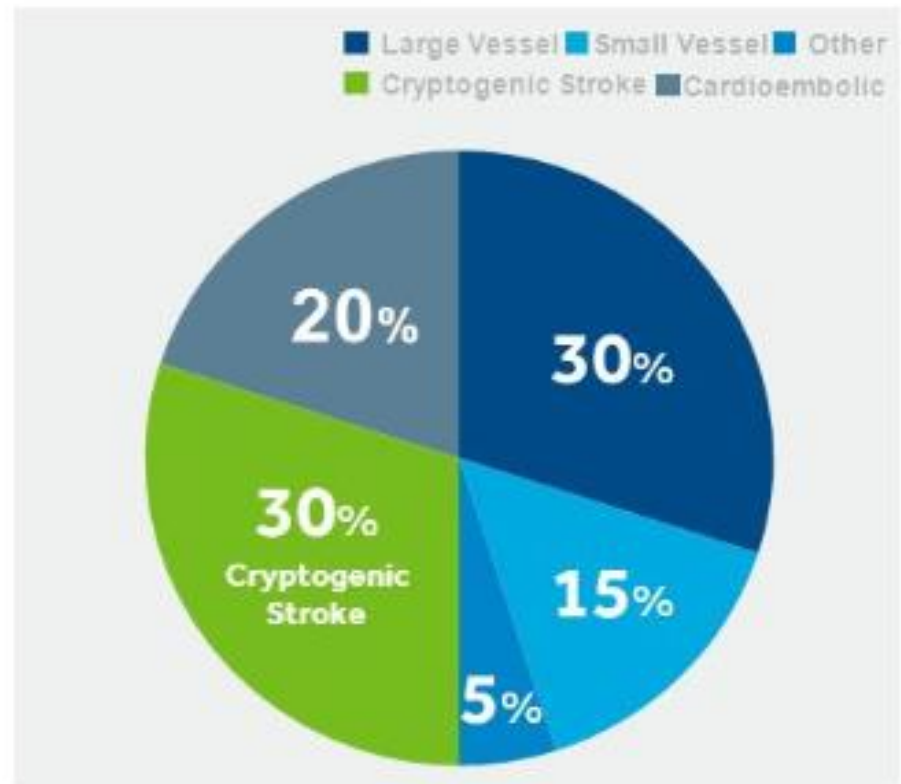
WHAT IS A CRYPTOGENIC STROKE?

- “The term cryptogenic stroke designates the category of ischemic stroke for which no probable cause is found despite a thorough diagnostic evaluation”
- First devised for research purposes and for the National Institute of Neurological Disorders and Stroke (NINDS) Stroke Data Bank and later modified in the TOAST trial

CRYPTOGENIC STROKE FACTS

- Accounts for about 1/3 of all stroke patients
 - About 200,00 per year in the US
- Not specific to age/gender/race
- Is a diagnosis of exclusion after all other risk factors are considered

Ischemic Stroke



USUAL STROKE IN-PATIENT WORKUP

- Labs—CBC, BMP, cardiac enzymes, troponins, lipids, A1C
- Brain Imaging—CT, MRI
- Vessel Imaging—CTA, MRA, Carotid Doppler
- Cardiac Evaluation—ECG, Cardiac monitoring , TTE (Echo), TTE

- Advanced workup: cerebral angiography or labwork for hypercoagulable states and/or extended cardiac monitoring

PAROXYSMAL ATRIAL FIBRILLATION AS RISK FACTOR FOR CRYPTOGENIC STROKE

- **84 days** is the median time to AF detection in cryptogenic stroke patients
- 5x increase in stroke risk for AF patient
- 2x more likely for AF-related ischemic stroke to be fatal when compared to non-AF stroke
- Not always detected during hospital stay

- **Outpatient Monitoring**
 - Holter monitors--don't always wear, can't wear in shower, Zio Patch—14 day monitoring, Can shower with monitor
 - Long-term Monitoring—Loop Recorders

GUIDELINES SAY:

■ 2018 Stroke Guidelines

Recommendations	COR	LOE
Cardiac monitoring is recommended to screen for atrial fibrillation and other potentially serious cardiac arrhythmias that would necessitate emergency cardiac interventions. Cardiac monitoring should be performed for at least the first 24 hours.	I	B-NR
The clinical benefit of prolonged cardiac monitoring to detect atrial fibrillation after AIS is uncertain.	IIb	B-R
In some patients with AIS, prolonged cardiac monitoring to provide additional information to plan subsequent secondary preventative treatment may be reasonable, although the effect on outcomes is uncertain.	IIb	C-EO

■ 2016 European Guidelines

- In patients with TIA or ischemic stroke, screening for AF is recommended by short-term ECG recording followed by continuous ECG monitoring for at least 72 hours
- In stroke patients, additional ECG monitoring by long-term noninvasive ECG monitors or implanted loop recorders should be considered to document silent atrial fibrillation.

IMPLANTABLE LOOP RECORDERS

- **Simple, minimally invasive insertion**
 - Done in the Hospital
 - Done Outpatient
- **2-4 years of continuous cardiac monitoring**
 - Followed in Monitoring Center
 - Linked to a cardiologist
- **MRI Compatible**
- **Reimbursed by insurance**



TYPES OF IMPLANTABLE LOOP RECORDERS



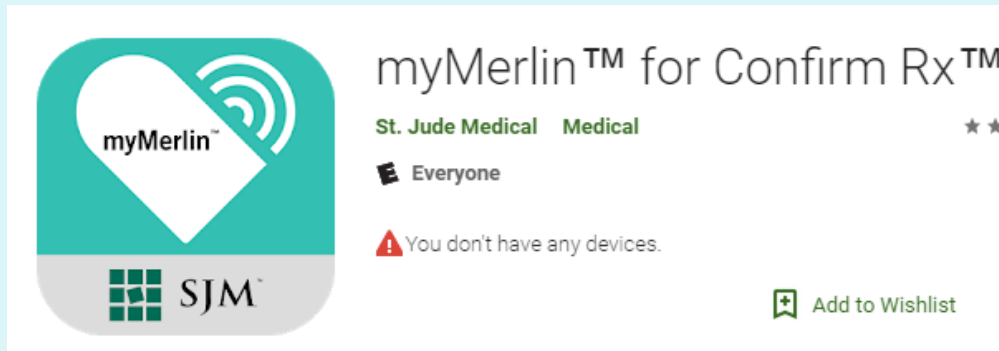
BIOMONITOR 2-AF BY BIOTRONIC

- Up to 4 years of continuous monitoring
- Transmits data via smart phone and a battery-operated transmitter that lasts 48 hours
- Biomonitor III released 2019



CONFIRM RX BY ABBOTT (ST. JUDE)

- 2 year battery life
- Uses Smartphone app and Bluetooth technology to transmit info—myMerlin app
 - Patients can view transmitted data and add information
 - Must be within 5 feet of phone to transmit



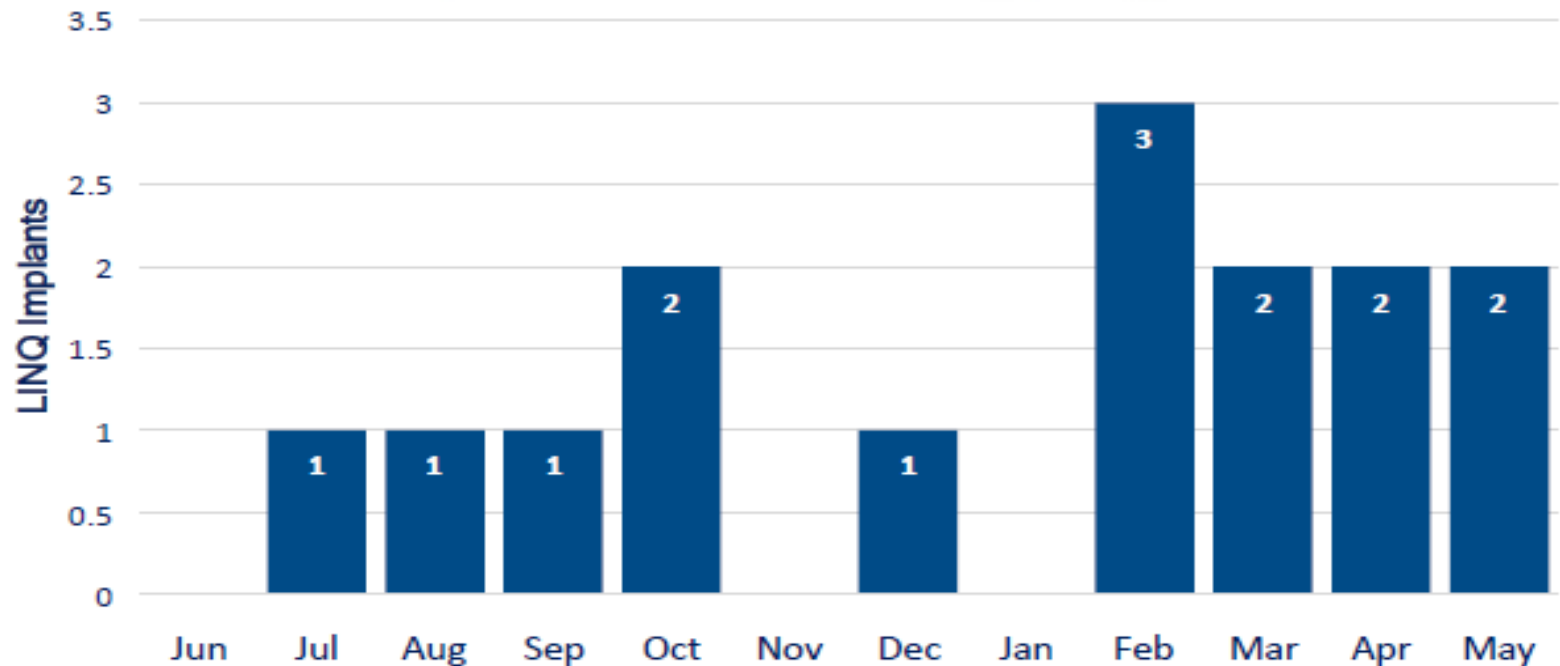
LINQ BY MEDTRONIC

- 3 years Battery Life
- Uses CareLink Monitor
- Smallest of 3
- Learns patients rhythms



MARYVIEW VIEW DEVICE IMPLANTATION

Reveal LINQ™ Implant Volume for Cryptogenic Stroke*



- 15 patients since July 2018
- 21% of predicted cryptogenic stroke volume (estimated 112/yr)

ADVANCES IN CARDIAC MONITORING

Cardiac monitors have been used for years to help physicians determine if a patient is experiencing an irregular heartbeat (or arrhythmia) that is causing recurrent fainting, palpitations, unexplained stroke or atrial fibrillation. Over time, these devices have grown smaller... and smarter... evolving from large, wired, external devices to miniature, insertable devices that are nearly invisible to the naked eye when implanted.

KEY

- ♥ = Duration of use
- ⊘ = Not water-resistant
- 💧 = Water-resistant
- 👕 = Worn externally
- 👤 = Implanted under the skin
- 📶 = Device automatically transmits data to physicians via wireless connection

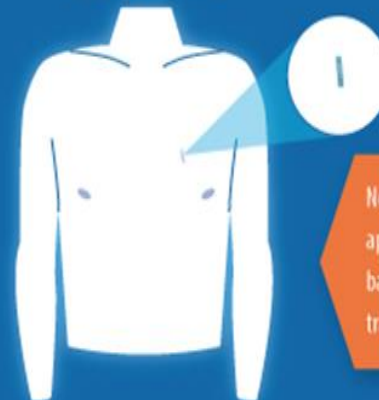
External Cardiac Monitors



♥ Up to 30 days



Miniaturized Insertable Cardiac Monitor



♥ Up to 3 years



Nearly invisible on most patients; approximately 1/3 the size of a AAA battery with wireless data transmission capabilities

MOVING FORWARD

- More Awareness about Cryptogenic Stroke and Afib relationship
- More patients eligible for loop recorders
- Closer relationship with cardiology
- Doing more loop recorders prior to discharge rather than waiting for OP or READMISSION for another event



