Cryptogenic Stroke
Finding the Rhythm

Luis Garcia MD, FHRS
Cardiac Electrophysiology

Orlando Health

Heart Institute

October 7, 2017

ORLANDO HEALTH®

Background

- 30% of ischemic strokes are of unknown mechanism (cryptogenic stroke)
- Detection of AF usually prompts long term anticoagulation instead of antiplatelet therapy
- Optimal monitoring duration to detect AF is currently undetermined. **Guidelines-** 24 hour- 30days.
- AF may be paroxysmal, occur rarely, and be asymptomatic, making detection with routine methods difficult

(CRYSTAL AF)

CRYptogenic STroke and underlying AtriaL Fibrillation

- To assess whether a long-term cardiac monitoring strategy with an implantable cardiac monitor (ICM) is superior to standard monitoring for the detection AF in patients with cryptogenic stroke

- Determine the proportion of patients with cryptogenic stroke that have underlying AF

- Determine actions taken after patient is diagnosed with AF

Sanna Nejm 2014

Inclusion/Exclusion Criteria

Inclusion:

• ≥40 years of age

•Cryptogenic stroke (or clinical TIA), with infarct seen on MRI or CT, within the previous 90 days; and no mechanism (including AF) determined after:

- 12-lead ECG
- 24-hour ECG monitoring (e.g. Holter)
- Transesophageal echocardiography (TEE)
- CTA or MRA of head and neck to rule out arterial source
- Screening for hypercoagulable states in patients <55 years old

Exclusion:

•History of AF or Atrial Flutter

•Permanent indication or contraindication for anticoagulation

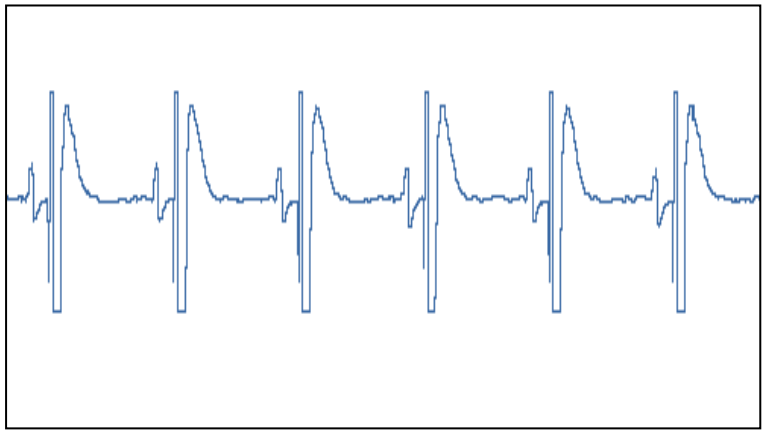
•Indication for pacemaker or implantable cardioverter defibrillator

Baseline Characteristics:

	ICM (221)	Control (220)
Age	61.6 ± 11.4 years	61.4 ± 11.3 years
Gender - Male	142 (64.3%)	138 (62.7%)
Index Event – Stroke	200 (90.5%)	201 (91.4%)
Index Event – TIA	21 (9.5%)	19 (8.6%)
Pre-enrollment AF screening – Holter Monitoring	71.5% of patients Median of 23 hours (IQR 21-24)	70.9% of patients Median of 24 hours (IQR 22-24)
Pre-enrollment AF screening – Telemetry	29.9% of patients Median of 48 hours (IQR 36-96)	29.5% of patients Median of 72 hours (IQR 48-96)
Time between index event and randomization	36.6 ±28.2 days	39.6 ±26.9 days
Time to randomization and device insertion	8.7 ± 27.6 days	n/a

Long term monitoring
Implantable loop recorder

- Implantable underneath skin
  (5-7 minutes in sterile manner)
- Battery life 2-3 years
- Records bradycardia and tachycardia
- Can identify Atrial Fibrillation



Courtesy of Medtronic, Biotronik

Atrial Fibrillation

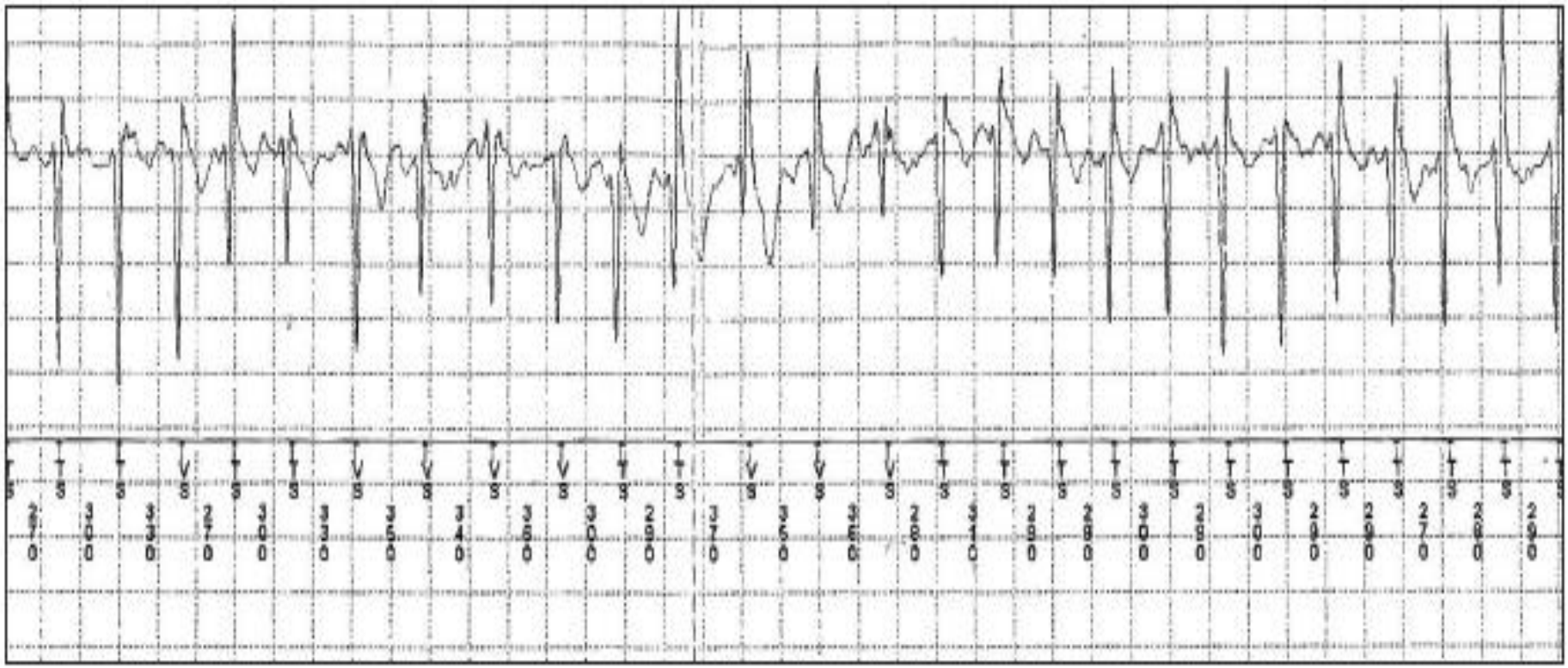


Figure 2: Reveals rapid atrial fibrillation in a patient with an unexplained stroke.

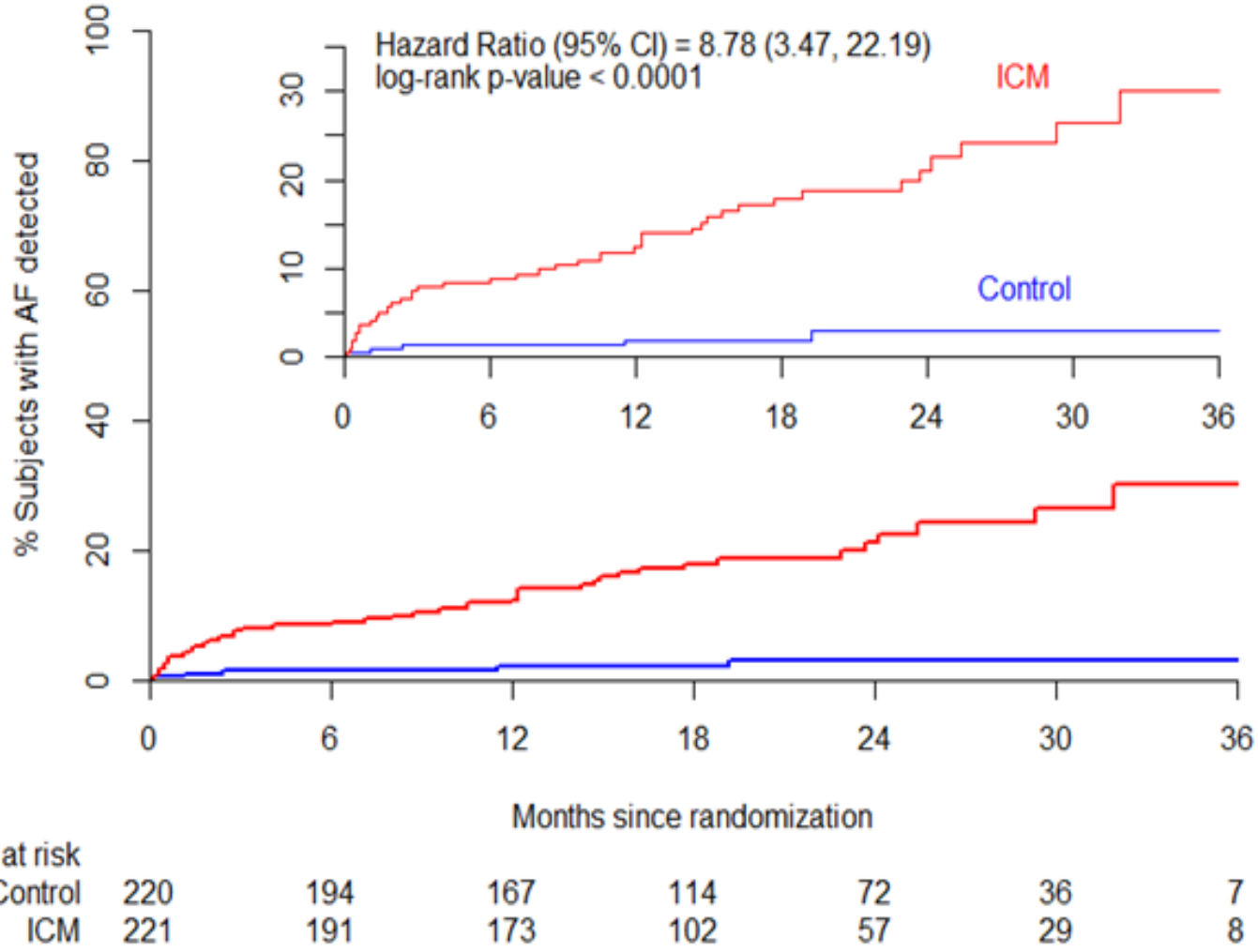
What is the Detection of AF at 3 years?
ICM found 30% of patients had AF!

- **Detection**

ICM - 30%

vs.

Standard- 3%



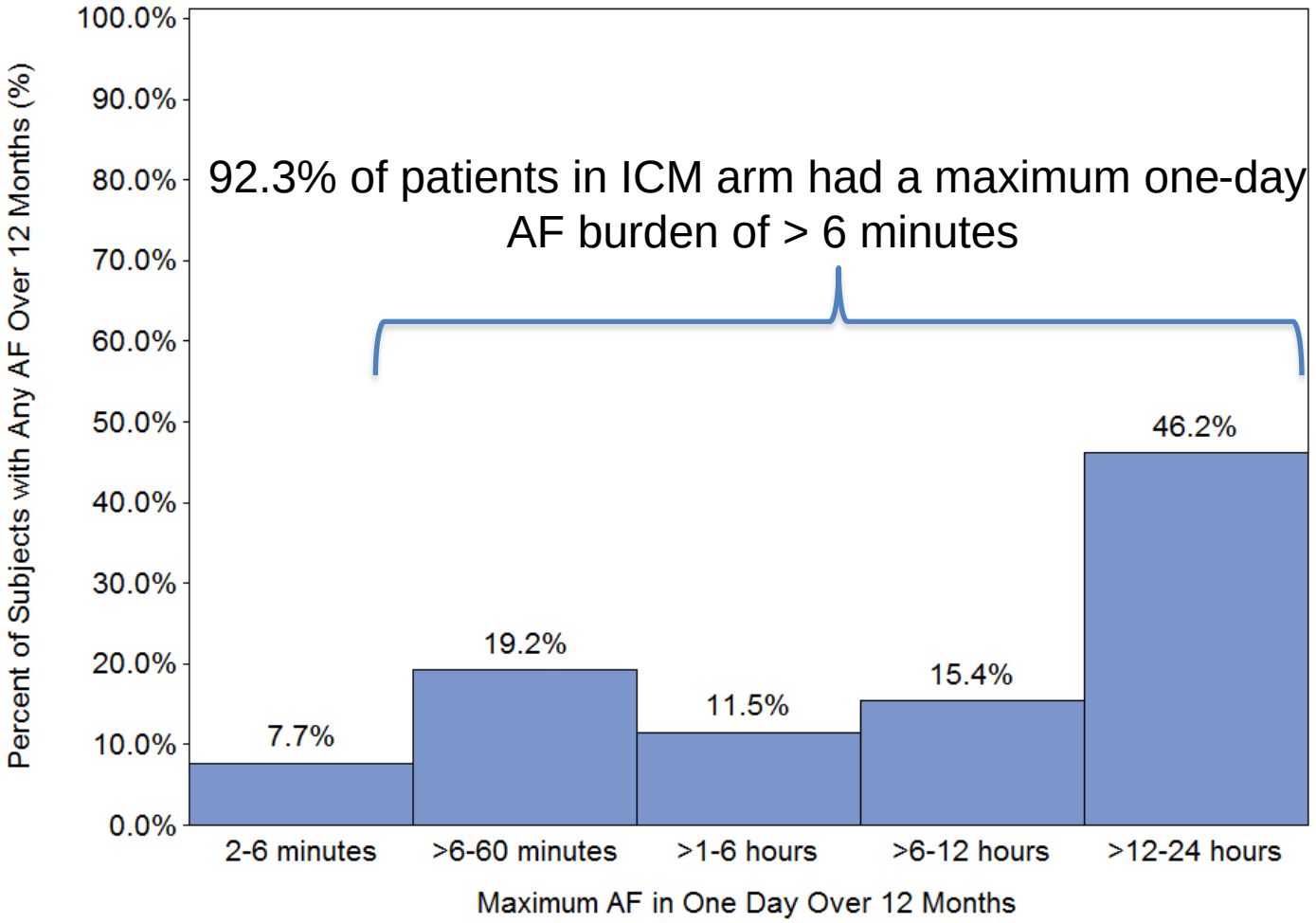
6 Month Endpoints

	ICM	Control
Median Time from Randomization to AF Detection	41 days	32 days
Patients found to have AF	19	3
% Asymptomatic Episodes	74%	33%
Oral Anticoagulation Usage, overall	10.1%	4.6%
OAC use in patients with detected AF	94.7%	66.7%
Testing required to detect AF	Automatic AF detection	88 ECGs 20 24-hour Holters 1 event recorder

12 Month Endpoints

	ICM	Control
Median Time from Randomization to AF Detection	84 days	52.5 days
Patients found to have AF	29	4
% Asymptomatic Episodes	79%	50%
Oral Anticoagulation Usage, overall	14.7%	6.0%
OAC use in AF patients	96.6%	100%
Tests required to find AF	Automatic AF detection	121 ECGs 32 24-hour Holters 1 Event Recorder
Complications	5 (2.4%) ICMs removed due to insertion site infection or pocket erosion	None

AF duration was meaningful and acted on
97% of patients with AF were prescribed OAC



61.6% of patients had maximum one-day AF burden of > 6 hours

Conclusions: Cryptogenic Stroke

- **Long term rhythm monitoring is an important tool in the diagnosis of Cryptogenic Stroke**
- **Atrial fibrillation prevalence is Significant and Elevated in the Cryptogenic Stroke population**
- **The identification of AF and the impact of anticoagulants in the prevention of future events is largely unknown**

Thank You!

Questions????