AF Screening Update

원광대학교병원 순환기내과

김 남 호
Topics

- Incidence of screen detected AF
- Risk of stroke and death in untreated screen detected AF
- Response to treatment of screen detected AF
- Which patients or individuals to screen?
- Screening methods
- Settings for screening
- Current guideline
AF Detection with ECG

US Preventive Services Task Force

Screening for Atrial Fibrillation With Electrocardiography

Population
Adults aged 65 years and older who do not have symptoms of atrial fibrillation

Symptoms of atrial fibrillation include heart palpitations, dizziness, lightheadedness, and shortness of breath.

USPSTF recommendation
There is not enough evidence to say whether using electrocardiography to look for atrial fibrillation is beneficial in older adults with no symptoms.

Source
Systematic vs SAFE,23-27
Morgan,28
Systematic vs SAFE,23-27
REHEARSE-
Opportunistic
SAFE,23-27
Any screening
SAFE,23-27

Should We Screen for AF?

HEAD TO HEAD

Should we screen for atrial fibrillation?

Current evidence is sufficient to justify a national screening programme, argues Mark Lown, but Patrick Moran thinks there are too many unanswered questions and evidence from randomised trials is needed to avoid overdiagnosis

Mark Lown clinical lecturer, Patrick Moran senior research fellow in health economics

*Primary Care and Population Sciences, Faculty of Medicine, University of Southampton, Alder Moor Health Centre, Southampton, UK; †Trinity College Dublin, Ireland

Yes—Mark Lown

Atrial fibrillation (AF) is detected in around a third of all patients with ischaemic stroke. Data from stroke registries show that in these patients, untreated, or underdetected AF is responsible for most of the strokes, which are often fatal or debilitating.1 AF screening has been the subject of much recent debate by international collaborations of experts and in the UK parliament because of the increasing prevalence of AF (the number of patients in the UK is predicted to rise from 700,000 in 2010 to between 1.3 and 1.8 million by 2060) and the potential to prevent AF related strokes with appropriate anticoagulation.

Although data from randomised controlled trials are lacking, cohort studies indicate that screen detected AF is not a benign condition and, in the presence of additional risk factors, warrants consideration of anticoagulation. In a cohort study of 5555 asymptomatic patients with incidentally detected AF, anticoagulation therapy (n=2492) compared with no antithrombotic therapy (n=1460) was associated with significantly reduced adjusted risk of stroke from 4% to 1%, and risk of death from 7% to 4% in just 1.5 years.3 This suggests could mitigate the risk. Current evidence provides a strong case for introducing AF screening now. The outcomes of large randomised trials of screening, such as those proposed by Munt and colleagues,4 would strengthen the evidence base. The UK screening committee is due to review its recommendations in the near future.

No—Patrick Moran

The case for making screening a central pillar of efforts to tackle the looming epidemic of atrial fibrillation is promising, but important gaps in the evidence base for this intervention remain. These include questions about the effect of screening on stroke outcomes; the optimal combination of screening test, screening strategy, and target population; and the opportunity cost of implementing population based programmes. The growing international momentum behind AF screening should be harnessed to ensure that these important gaps in knowledge are filled, rather than being overlooked as a result of understandable eagerness to take action on a major challenge facing health systems globally.5

AF seems to meet many of the criteria for disease screening developed by Wilson and Jungner.6 It is an important health problem that can be diagnosed using a readily available test, and proved treatments exist to reduce the risk of AF related stroke. However, although experimental and observational evidence indicates that screening increases AF detection, we have no evidence from randomised controlled trials that screening reduces the incidence or severity of stroke in screened versus unscreened populations.5 13

Risk profile assumptions

In an era when the scale of overdetection and overtreatment in modern medicine is becoming increasingly clear, any assumption that greater AF detection equates to improved health outcomes requires serious critical scrutiny.14 Such an assumption implies that the risk profile of screen detected patients—and by extension their propensity to use, benefit from, and be harmed by, anticoagulant treatment—is the same as those presenting clinically.

Screening strategy unclear

From a policy perspective, there is considerable ambiguity about how screening would be scaled up and implemented in practice, given the high level of heterogeneity in the target population, screening test, and screening strategy used in previous studies. For example, the three trials that showed increased AF detection rates included different populations, different tests, and different ECG readers.22 24 The available evidence does not, therefore, present decision makers with a uniformly defined solution that can be transposed into policy.

Furthermore, the rapid pace of development in ECG diagnostics—including the use of smartphone apps, wearable devices, and automated ECG interpretation—has the potential to diminish the applicability of previous research carried out using older technology.

All screening studies to date have used one off testing within a given population, so the effect of successive screening rounds on the detection of incident or paroxysmal disease is also unknown. The only available data on the comparative effectiveness and cost effectiveness of different start ages and screening frequencies, which is of crucial importance for the design of a screening programme, come from simulation modelling studies.12 13 14

Coordinated, concerted efforts are required to combat the steep rise in AF associated with worldwide population ageing.15 However, in the absence of research that reliably confirms the health benefits of screening and provides sufficient information to guide successful implementation there remains considerable uncertainty about the potential for screening to reduce the burden of AF related morbidity and mortality in society.

Competing interests: Both authors have read and understood BMJ policy on declaration of interests and M.L. declares that he is a collaborator on the upcoming trial to investigate screening for atrial fibrillation led by Professor Munt and colleagues.

Provenance and peer review: Commissioned; externally peer reviewed.


Lown M. Moran P. BMJ 2019;364:k43
Should We Screen for AF?

• Several factors have led to an increased interest in AF screening
  – Increased prevalence
  – Newer effective treatments
  – Development of relatively inexpensive screening devices
Should We Screen for AF?

• Several outstanding issues and in particular
  − Lack of evidence
  − Is screening for AF cost-effective?
  − The uptake of anticoagulation for established AF is poor.
  − Many primary care professionals cannot accurately detect AF on an ECG.
  − Should the screening include screening for paroxysmal AF?
World Health Organization
- Principle of Early Disease Detection -

1. The condition sought should be an important health problem.
   AF is the most common heart arrhythmia, affecting more than 33 million people worldwide.¹
   AF is associated with increased risk of stroke, heart failure, myocardial infarction, dementia and a doubling of mortality.² ³

2. There should be an accepted treatment for patients with recognized disease.
   All guidelines recommend OAC treatment for AF patients at increased risk of stroke based on the CHA₂DS₂-VASc stroke risk score.⁹

3. Facilities for diagnosis and treatment should be available.
   Facilities required for diagnosis and treatment are inexpensive and readily available in primary care. Requirements include clinician time to palpate the carotid, an ECG rhythm strip, use of 12-lead ECG and aspirin. Asymptomatic stroke cases involve unanticipated stroke events even when

4. There should be a recognizable latent or early symptomatic stage.
   In general, the natural history of AF is well understood (particularly the risk of stroke),⁴⁶ ⁴⁹ although there is still additional evidence emerging about the aetiology of AF.
   Once AF is diagnosed, guidelines clearly define which patients require treatment with OAC to prevent stroke.⁹

5. There should be a suitable test or examination.
   At least eight studies with economic analyses of AF screening indicate that it is likely to be cost-effective, or even cost-saving.¹⁴

6. The test should be acceptable to patients and clinicians.
   Guidelines⁹ recommend opportunistic single-timepoint screening for people aged ≥65 years, but there is no agreed frequency for repeat screening. We suggest that annual screening for people aged ≥65 would be a preferred model.

7. The natural history of AF will be adequately understood.
   The cost of case-finding (including diagnosis and treatment of patients diagnosed) should be economically balanced in relation to possible expenditure on medical care as a whole.

8. There should be a process to identify who to treat as patients.
   Case-finding should be a continuing process and not a ‘once and for all’ project.
Incidence of Screen Detected AF

• The incidence of screen detected AF strongly depends on the population screened and duration/intensity of screening
  - Single timepoint screening of general population ≥ 65 years of age: undiagnosed AF 1.4%
  - 75 to 76 years of age, 2 week screening program using twice daily intermittent handheld ECG recording: 3.0%
  - Incidence of atrial high-rate episodes in patients with CIEDs: 30–60%
## Incidence of Screen Detected AF

<table>
<thead>
<tr>
<th>Study</th>
<th>Number of participants</th>
<th>Target population</th>
<th>Mean age (years)</th>
<th>Response rate (%)</th>
<th>Screening tool</th>
<th>Confirmation with 12-lead ECG</th>
<th>Total AF detected, n (%)</th>
<th>Previously undiagnosed AF detected, n (%)</th>
<th>Patients* Indicated and given OAC, n (%)</th>
<th>NNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furborg et al. 1994**</td>
<td>5,151</td>
<td>Random sample of citizens from Medicare eligibility lists from four US communities</td>
<td>N/A (≥65)</td>
<td>57.6</td>
<td>12-lead ECG</td>
<td>N/A</td>
<td>277 (5.4)</td>
<td>77 (1.49)</td>
<td>N/A</td>
<td>67</td>
</tr>
<tr>
<td>Meisch et al. 2010#</td>
<td>29,861</td>
<td>Black Americans and residents of the southeastern 'stroke belt region' in the US</td>
<td>74.0 (median)</td>
<td>49.0</td>
<td>N/A</td>
<td>12-lead ECG</td>
<td>432 (1.4)</td>
<td>174 (0.58)</td>
<td>85 (28.9)</td>
<td>172</td>
</tr>
<tr>
<td>Schneider et al. 2012#</td>
<td>5,000</td>
<td>Persons aged 35-74 from the city of Mainz and Mainz-Elbinger region in Germany</td>
<td>52.2</td>
<td>60.4</td>
<td>12-lead ECG</td>
<td>N/A</td>
<td>161 (3.2)</td>
<td>25 (0.5)</td>
<td>N/A</td>
<td>200</td>
</tr>
<tr>
<td>Frewen et al. 2013#</td>
<td>4,890</td>
<td>Community-dwelling citizens aged ≥50 years in the Republic of Ireland</td>
<td>63.8</td>
<td>37.1</td>
<td>3-lead ECG</td>
<td>No</td>
<td>118 (2.4)</td>
<td>45 (0.97)</td>
<td>N/A</td>
<td>109</td>
</tr>
<tr>
<td>Svennberg et al. 2015*</td>
<td>7,173</td>
<td>75-76-year-old population in Stockholm county or the Halland region in Sweden</td>
<td>N/A</td>
<td>53.8</td>
<td>1-lead ECG</td>
<td>No</td>
<td>884 (12.3)</td>
<td>218 (3)</td>
<td>203 (93)</td>
<td>Single ECC: 200, Twice daily ECG for 2 weeks: 33</td>
</tr>
<tr>
<td>Chan et al. 2016*</td>
<td>13,122</td>
<td>Untargeted voluntary participation by Hong Kong citizens aged ≥65 years in Hong Kong</td>
<td>64.7</td>
<td>N/A</td>
<td>1-lead ECG</td>
<td>No</td>
<td>229 (1.8)</td>
<td>101 (0.8)</td>
<td>N/A</td>
<td>129</td>
</tr>
</tbody>
</table>

추가적인 AF 진단: 0.5–3.0%

Chan NY. Arrhythm Electrophysiol Rev 2018:7:39–42
AF Detection Using Single-lead ECG

대상자 (1033명)

AF (37명/3.6%)

New AF (24명/2.3%)

Known AF (13명)

Non-AF

Kardia Mobile (AliveCor)

기간: 2019.2 - 6월
대상자: 60세 이상
New detected AF: 2.3%
AF Detection Using Single-lead ECG
Risk of stroke and death in untreated screen detected AF

- No RCT data
- Cohort studies
  - UK Clinical Practice Research Data
    - Adjust stroke rate: 4% vs 1%, mortality 7% vs 2.5% over 1.5 years of f/u
  - EORP AF registry
    - Mortality at 1 year was >2 fold higher in asymptomatic vs symptomatic AF

Screen detected AF as found on single-timepoint screening or intermittent 30-second recordings over 2 weeks is not a benign condition.


WONKWANG UNIVERSITY
Risk of stroke and death in untreated screen detected AF

REHEARSE-AF trial

5846 Potential participants (5726 identified using GP databases, 120 invited following research centre attendance)

1272 Volunteered to participate

1004 Enrolled

500 AliveCor (intervention arm)

501 Standard Care (control arm)

3305 Did not respond
1269 Declined invitation

268 Excluded for clinical or logistical reasons

3 Excluded due to protocol violations

AF 진단: 19 vs 5 patients, HR 3.9; 95% CI 1.4–10.4, p=0.007
Stroke/TIA/systemic embolic events: 6 vs 10, HR 0.61; 95% CI 0.22–1.69, p=0.34

Response to Treatment of Screen Detected AF

- No RCT data
- Cohort studies
  - UK Clinical Practice
    - OAC therapy (n=2492) compared with no antithrombotic therapy (n=1460) was associated with significantly reduced adjusted risk of stroke from 4% to 1% and death from 7% to 4% in only 1.5 years
- Ongoing studies
  - ATRESiA (Apixaban for the reduction of thromboembolism in patients with device detected subclinical AF)
  - NOAH (Non–vitamin K antagonist oral anticoagulants in patients with atrial high rate episodes)

Response to Treatment of Screen Detected AF

Mass screening in 75 to 76 year old individuals with intermittent ECG recording yields a considerable proportion of individuals with untreated AF who can be started on OAC treatment.

STROKESTOP study

Sweden

- New AF: n=218
  - Untreated: n=213
  - OAC Initiated: n=198
  - OAC not initiated: Patient preference n=6
    - Contra-indications; Malignancy, n=2
    - GI-bleed, n=1
    - Dementia, n=2
    - Severe co-morbidity, n=3
    - Other, n=1

- Known AF: n=666
  - Untreated: n=149
  - On OAC: n=517
  - OAC Initiated: n=70
  - OAC not initiated: Patient preference n=36
    - Contra-indications; Malignancy, n=2
    - GI-bleed, n=6
    - ICH, n=3
    - Severe co-morbidity, n=10
    - Lost to F/U, n=15
    - Still undecided, n=1

Cost-effectiveness of Screening

Netherlands
Markov model
\[ \geq 65 \text{ years attending seasonal influenza vaccination} \]
Handheld, single-lead ECG, MyDianostick

Screening for AF in primary care with a handheld, single-lead ECG during seasonal influenza vaccination is very likely to be cost saving for identifying new case of AF in the Dutch population aged 65 years and over.

Jacobs MS, et al. 2016 Europace
Cost-effectiveness of Screening

Belgian Heart Rhythm Week Screening Programme
Markov model
≥ 65 years and ≥ 75 years old
Handheld, single-lead ECG, Omron HeartScan HCG-801

In a population-wide screening cohort, the use of handheld ECG machine to identify subjects with newly diagnosed AF was cost effective in the general population, as well as in subjects ≥ 65 and subjects ≥ 75 years old.
Which Patients or Individuals to Screen?

- Single-timepoint screening of people $\geq 65$ years of age in the clinic or community appears justified based on yield of screening and likely cost-effectiveness.
- For those $> 75$ years of age or in young age groups at high risk of AF or stroke, 2 weeks of twice-daily intermittent AF screening may be warranted.
Screening Methods

- Clinical screening
  - Risk scores
  - Pulse taking
  - Automated BP monitors

- Implanted devices
  - Pacemaker
  - ICD
  - ILR
  - Telemetry

- ECG screening
  - Single lead
    - Electronic stick
    - Single channel ECG monitor
    - Monitoring patch
    - Watch-like recorder
  - Multi-lead
    - Holter monitoring
    - Multielectrode belt
  - New tools
    - Photoplethysmographic app
    - Smartphone+casing electrode
    - Smartphone handheld ECG
Screening Methods
- Pulse Taking -

The SAFE study: patients aged 65 years and over

Opportunistic screening: all patients

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th>Age &lt;75</th>
<th>Age ≥75</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 2028 (%)</td>
<td>n = 2710 (%)</td>
<td>n = 2700 (%)</td>
<td>n = 2038 (%)</td>
</tr>
<tr>
<td>Pulse taken</td>
<td>1367 (67.4)</td>
<td>1911 (70.5)</td>
<td>1899 (70.3)</td>
<td>1379 (67.7)</td>
</tr>
<tr>
<td>Irregular pulse</td>
<td>188 (13.8)</td>
<td>173 (9.1)</td>
<td>162 (8.5)</td>
<td>199 (14.4)</td>
</tr>
<tr>
<td>Had ECG</td>
<td>138 (73.4)</td>
<td>100 (57.8)</td>
<td>114 (70.4)</td>
<td>124 (62.3)</td>
</tr>
<tr>
<td>AF</td>
<td>49 (35.5)</td>
<td>35 (35.0)</td>
<td>35 (30.7)</td>
<td>49 (39.5)</td>
</tr>
</tbody>
</table>

Opportunistic screening: patients without AF diagnosis at baseline

A strategy of opportunistic screening of the pulse, followed by ECG if positive, has been found to be effective at detecting new cases of AF.
Screening Methods - BP Automated Measurement -

- Microlife WatchBP Home–A
  - Irregular heart beat detector

AF detection with routine **automated BP measurement** is a **reliable screening tool** in the elderly, which requires confirmation by ECG.

Screening Methods
- Photoplethysmographic Signal -

Subjects: 1013
- 985: no AF
- 28: AF

AliveCor single-lead ECG vs Cardiio Rhythm smartphone PPG application
Sensitivity: 71.4% (95% CI: 51–87%) vs. 92.9% (95% CI: 77–99%)
Specificity: 99.4% (95% CI: 99–100%) vs. 97.7% (95% CI: 97–99%)

The Cardiio Rhythm smartphone PPG application provides an accurate and reliable means to detect AF in patients at risk of developing AF and has the potential to enable population-based screening for AF.
Screening Methods
- Single-lead ECG -

REHEARSE-AF trial

5846 Potential participants (5726 identified using GP databases, 120 invited following research centre attendance)

1272 Volunteered to participate

1004 Enrolled

- 500 AliveCor (intervention arm)
- 501 Standard Care (control arm)

Letter of invitation

1269 Declined invitation

Telephone call, research centre visit

3305 Did not respond

268 Excluded for clinical or logistical reasons

3 Excluded due to protocol violations

AF 진단: 19 vs 5 patients, HR 3.9; 95% CI 1.4–10.4, p=0.007
Stroke/TIA/systemic embolic events: 6 vs 10, HR 0.61; 95% CI 0.22–1.69, p=0.34

The mSToPS Trial

Subjects: 2659 individuals were randomized.
- 1366: immediately monitoring > 906
- 1293: delayed monitoring for 4 months > 832

Among individuals at high risk for AF, immediate monitoring with a home-based wearable ECG sensor patch, compared with delayed monitoring, resulted in a higher rate of AF diagnosis after 4 months. Monitored individuals, compared with nonmonitored controls, had higher rates of AF diagnosis, greater initiation of anticoagulants, but also increased health care resource utilization at 1 year.
Screening Methods

AF Detection using portable ECG devices based on monitoring time per patient

Graph showing the linear relationship between total monitoring and AF detection rate in single-lead ECG devices

Ramkumar S, et al. BMJ Open 2018;8:e024178
Screening Methods
- Smartwatch -

WATCH AF Trial
PPG signal

Smartwatches may be useful complementary tools for long-term AF screening in selected at-risk patients must be evaluated in larger population-based samples.

Screening Methods
- Smartatch -

- Apple Watch 4
- 휴이노
  - 정보통신기술(ICT) 규제 샌드박스
  - 식약처 의료기기 허가 : 2019.3
  - 심전도 측정 기능이 있는 웨어러블 기기 이용자에 의료법 제33조 문제
- 삼성, 심전도 측정 센서 미 FDA 승인 : 2019.2
- 제한점
  - 전문 의료기기 : 식약처 허가가 필요
  - 의료법 제33조 : 원격진료
Screening Methods

Because of ECG confirmation is mandated by guidelines for the diagnosis of AF, **handheld ECG devices** have the advantage of providing a verifiable ECG trace and would therefore be preferred screening tool.

<table>
<thead>
<tr>
<th>Device</th>
<th>Method of Interpretation</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse palpation</td>
<td></td>
<td>94 (84–97)</td>
<td>72 (69–75)</td>
<td>Cooke et al^55</td>
</tr>
<tr>
<td>Handheld single-lead ECGs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AliveCor (Kardia) heart monitor</td>
<td>Algorithm only (based on presence of P wave and RR irregularity)</td>
<td>98 (89–100)</td>
<td>97 (93–99)</td>
<td>Lau et al^56</td>
</tr>
<tr>
<td>Merlin ECG event recorder</td>
<td>Cardiologist interpretation</td>
<td>93.9</td>
<td>90.1</td>
<td>Kearley et al^57</td>
</tr>
<tr>
<td>Mydiagnostick</td>
<td>Algorithm only (based on RR irregularity)</td>
<td>94 (87–98)</td>
<td>93 (85–97)</td>
<td>Tieleman et al^53</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vaes et al^55</td>
</tr>
<tr>
<td>Omron HCG-B01</td>
<td>Algorithm only (based on RR irregularity)</td>
<td>98.7 (93.2–100)</td>
<td>76.2 (73.3–78.9)</td>
<td>Kearley et al^57</td>
</tr>
<tr>
<td>Omron HCG-B01</td>
<td>Cardiologist interpretation</td>
<td>94.4</td>
<td>94.6</td>
<td>Kearley et al^57</td>
</tr>
<tr>
<td>Zenicor EKG</td>
<td>Cardiologist interpretation</td>
<td>96</td>
<td>92</td>
<td>Doliwa et al^60</td>
</tr>
<tr>
<td>Modified blood pressure monitors</td>
<td>Algorithm only (based on pulse irregularity)</td>
<td>92</td>
<td>97</td>
<td>Marazzi et al^61</td>
</tr>
<tr>
<td>Microlife BPA 200 Plus</td>
<td>Algorithm only (based on pulse irregularity)</td>
<td>97 (81.4–100)</td>
<td>90 (83.8–94.2)</td>
<td>Wiesel et al^62</td>
</tr>
<tr>
<td>Microlife BPA 200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Omron M6</td>
<td>Algorithm only (based on pulse irregularity)</td>
<td>100</td>
<td>94</td>
<td>Marazzi et al^61</td>
</tr>
</tbody>
</table>
Settings for Screening

- Settings that have been used effectively include some that are community-based and others based in primary care, specialist practices, or general or specialist clinics.

- Primary care and outpatient advantage of offering a and a potentially sustain
AF Screening

Whom to screen
- People aged >65
- Patients with AF who are undertreated
- Patients < 65 + enrichment
- Non-medical health care practitioners (pharmacy)
- General population, various venues
- Patient activated devices (BP/PPG)

Where to screen
- Primary care or Specialist clinics (country specific)
- Opportunistic public then ECG
- Single time point: single-lead ECG

How to screen
- Implantable devices with enrichment
- External long term +/- enrichment
- Patient-activated ECG (2 weeks), >75 or younger if high risk
- First stroke: ESUS - long-term continuous

Special cases

AF SCREEN preferred
Possible with further data
Currently too expensive at scale

2017 Report of AF Screen International Collaboration
Current Guidelines

• 2016 ESC Guideline

• ACC/AHA/HRS Guideline
  – No recommendation on the topic of screening but do state that early detection and treatment of asymptomatic AF before first complications occur is a recognized priority for prevention of stroke.
2016 ESC Guideline

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Class</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunistic screening for AF is recommended by pulse taking or ECG rhythm strip in patients &gt;65 years of age.</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>In patients with TIA or ischaemic stroke, screening for AF is recommended by short-term ECG recording followed by continuous ECG monitoring for at least 72 hours.</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>It is recommended to interrogate pacemakers and ICDs on a regular basis for atrial high rate episodes (AHRE). Patients with AHRE should undergo further ECG monitoring to document AF before initiating AF therapy.</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>In stroke patients, additional ECG monitoring by long-term non-invasive ECG monitors or implanted loop recorders should be considered to document silent atrial fibrillation.</td>
<td>IIa</td>
<td>B</td>
</tr>
<tr>
<td>Systematic ECG screening may be considered to detect AF in patients aged &gt;75 years, or those at high stroke risk.</td>
<td>IIb</td>
<td>B</td>
</tr>
</tbody>
</table>

- Undiagnosed AF is common, especially in older populations and in patients with heart failure.
2018 Korean Guideline

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Class</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunistic screening for AF is recommended by pulse taking or ECG rhythm strip in patients &gt;65 years of age.</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>In patients with transient ischemic attack (TIA) or ischemic stroke, screening for AF is recommended by short-term ECG recording followed by continuous ECG monitoring for at least 72 hours.</td>
<td>I</td>
<td>B</td>
</tr>
<tr>
<td>It is recommended to interrogate pacemakers and ICDs on a regular basis for AHRE. In cases of AHRE detected by a CIED of at least 5 minutes duration, we suggest that direct analysis of electrograms corresponding to AHRE is clinically indicated to exclude artifacts or other causes of inappropriate detection of atrial tachyarrhythmias or AF (ungraded consensus-based statement).</td>
<td>IIa</td>
<td>B</td>
</tr>
<tr>
<td>In stroke patients, additional ECG monitoring by long-term noninvasive ECG monitors or implanted loop recorders should be considered to document silent atrial fibrillation.</td>
<td>IIa</td>
<td>B</td>
</tr>
<tr>
<td>Systematic ECG screening may be considered to detect AF in patients aged &gt;75 years, or those at high stroke risk.</td>
<td>IIa</td>
<td>B</td>
</tr>
</tbody>
</table>

부정맥학회, 정확 인식 조사 결과 발표

2018년 08월 07일 03:16:59
문의처 기자: news@pmarticle.com

최근 들어 부정맥 치료 사망자가 급속히 증가하고 있으며 해당 점검에 대한 일반인의 인식이 낮아 적극적인 교육과 정확도를 이용한 선별 검사가 필요하다는 주장이 제기됐다. 또 고령 환자의 급사 위험성이 높은 만큼 65세 이상 고령자에 한해 건강 검진을 통한 정확도 자체가 필요하다는 의견이 나왔다.

감염증 대한부정맥학회 황정 "고려안방병원
순화기능"은 16일 서울시에서 3을 건의한
정신건강사 포럼에서 "65세 이상의 정확도 검사의
적절한 필요성"을 강조했다.

심전도검사 국민건강검진에 넣어야 할 이유는?

심전도 검사의 적절한 필요성에 대한 인식 제고에
대한 인식 제고 필요라고 강조했다.

3차원 편백 지도 분석

Anatomical Activation & Propagation Voltage Fractionation AT, VT AT, VT AF

“65세 이상 심전도 검사, 국민건강검진 항목 포함”
인생의 특별한 교육은 "적절한 국민 건강검진 항목 포함"의 필요를 제기했다.

심전도 검사의 적절한 필요성에 대한 인식 제고에 대한
인식 제고 필요라고 강조했다.
감사합니다