Supplementary Online Content

Chen W, Khurshid S, Singer DE, et al. Cost-effectiveness of screening for atrial fibrillation using wearable devices. JAMA Health Forum. 2022;3(8):e222419. doi:10.1001/jamahealthforum.2022.2419

eMethods. Supplemental Methods
eTable 1. Disease Incidence (per 1000 Person-Years)
eTable 2. Comorbidity Prevalence/Incidence (per 1000 Person-Years)
eTable 3. Disease Recurrence Rates (Monthly Probabilities)
eTable 4. Disease-Related Mortality (Monthly Probabilities)
eTable 5. Severity Measures
eTable 6. Utilities
eTable 7. Costs
eTable 8. Summary of Parameters Included in Sensitivity Analyses
eTable 9. Summary of Costs Associated With Each Screening Strategy
eTable 10. True and False Positive Rates by Strategy
eTable 11. Cost-effectiveness Results for Scenario Analyses
eTable 12. One-Way Sensitivity Analysis
eFigure. Cost-effectiveness Acceptability Curves
eReferences.

This supplementary material has been provided by the authors to give readers additional information about their work.
**eMethods.** Supplemental Methods

*Event-related costs*
For clinical events modeled (e.g., ischemic stroke, intracranial hemorrhage, and major bleeding), upfront costs were stratified by severity and obtained from the Agency for Healthcare Research and Quality ([https://hcupnet.ahrq.gov/#setup](https://hcupnet.ahrq.gov/#setup)) as follows: First, we extracted separate cost statistics for all International Classification of Diseases, 10th revision (ICD-10) diagnosis codes corresponding to the event of interest. Then, we sorted the costs in ascending order and divided them into quantiles equal in number to the categories of severity (e.g., tertiles for mild/moderate/severe groupings). Within each quantile, we utilized the mean hospital cost as the base case cost for the event at the corresponding severity level. The lower and upper bounds were set as the minimum and maximum cost values observed within the quantile.

In cases where one has multiple competing event-related costs, either the most relevant cost is incurred, or the maximum of the costs is incurred. For example, a history of stroke is associated with a maintenance cost associated with chronic post-stroke care. If a recurrent acute stroke occurs, only the upfront cost corresponding to the new stroke is invoked (since it is greater than the maintenance cost associated with chronic post-stroke care), with no additional maintenance cost.

*Drug/visit costs*
In cases where anticoagulation was stopped due to a history of major bleeding, or in accordance with modeled discontinuation rates, we assumed that the monthly drug cost would stop accumulating until the treatment regimen was resumed. We also assumed that physician visits for acute events (e.g., major bleeding) would also fulfill potential maintenance visit requirements. For example, if an individual on anticoagulation has a physician visit secondary to an acute bleed, that individual’s next annual physician visit for anticoagulation maintenance would be no less than one year after the acute bleed.

*Screening costs*
For discrete screening modalities, namely single-lead ECG, 12-lead ECG, pulse palpation, and patch monitor, a one-time screening cost was incurred if and only if the test was performed.

For costs associated wrist-worn wearable screening, a one-time upfront cost was incurred upon the start of screening (corresponding to initial purchase of the device) and an additional cost of replacing the device every five years was applied as long as the given strategy called for continued wearable screening.

For all screening strategies, a one-time nurse visit cost was incurred upon screening. Also, for strategies involving a wrist-worn wearable followed by a confirmatory patch monitor, an additional nursing visit cost was incurred after an abnormal wearable signal for prescription and application of the patch monitor.

Lastly, a physician visit cost was incurred for all instances where an ultimate diagnosis of AF was made (either true or false positive), corresponding to diagnosis counseling and prescription of anticoagulation if appropriate (i.e., no history of major bleeding).
**Modeling of paroxysmal AF**

Given lack of reliable data regarding the test characteristics of wearable devices for detecting paroxysmal AF over longer durations of monitoring (i.e., months to years), we modeled the temporal effect of screening via a wearable device as follows:

We applied literature-based values for the estimated prevalence of paroxysmal AF among individuals with screen-detected AF (59%).\(^1\)–\(^4\) We then utilized estimates of the average AF burden among individuals with paroxysmal AF (4.5%).\(^4\)–\(^6\) We assumed that the average AF burden follows a uniform distribution on the order of days (i.e., an individual with an AF burden of 4.5% would be expected, on average, to spend 4.5% of each day in AF).

Then, the probability that an individual will not experience a single AF episode over \(t\) days is \((1-0.045)^t\). The probability that an individual will experience at least one AF episode over \(t\) days is the complement, or \(1-(1-0.045)^t\). We then applied the known static test characteristics of the wearable device to the probability of observing AF with each cycle of simulation (i.e., one month or 30 days).

For example, an individual with AF wearing a watch for 3 months would have a probability of the device being exposed to an AF episode after one cycle of \(1-(1-0.045)^{30}\), or 0.749. If this individual is wearing a W-PPG (sensitivity 95.3, specificity 99.7), they will be diagnosed with AF with probability \(0.749 \times 0.953\), or 0.714 after one cycle. As with other screening modalities, if a diagnosis of AF is not made, and the screening strategy under evaluation includes continued screening, then the screening process will repeat as dictated by the length of the screening interval being evaluated. In this case of 3-month screening, screening would continue for three cycles, with a probability of being diagnosed with AF of 0.714 after each cycle, and the overall probability of being diagnosed with AF of \(1-(1-0.714)^3\) or 0.977.

Although the data provided by a recent study by Diedrichsen et al. are insufficient to primarily inform test characteristics over the necessary durations required to model wearable screening approaches, we were able to validate that our approach described above resulted in comparable estimates of sensitivity for paroxysmal AF at 30 days, after allowance for the uncertainty in AF burden, which we modeled in probabilistic sensitivity analyses (Table A).\(^7\)

**eMethods Table A.** Probability of AF episode with 30 days of monitoring

| Method                        | AF burden value | Probability |
|-------------------------------|-----------------|-------------|
| AF model (lower bound)        | 0.011           | 0.282       |
| AF model (base)               | 0.045           | 0.749       |
| AF model (upper bound)        | 0.17            | 0.996       |
| Diedrichsen et al.\(^7\)      | -               | 0.34        |

© 2022 Chen W et al. *JAMA Health Forum.*
Sensitivity analysis assumptions
In cases where uncertainty in model parameters could not be estimated based on the available published literature, we varied point estimates by +/- 20% when performing both one-way and probabilistic sensitivity analyses.

Simulation size determination
To determine sufficient cohort size for base case simulation taking into account first-order uncertainty (i.e., Monte Carlo error), we followed the guidelines provided by the ISPOR-SMDM Modeling Good Research Practices Task Force Working Group-6,8. Specifically, we tested results at increasing sample size from 10 million to 50 million and noted the comparative clinical effectiveness of all 8 screening strategies with respect to no screening, i.e., d(QALY), as well as the cost effectiveness results for all 5 cases. We report these values in the tables below. At a precision of 0.001 (i.e., 100 QALYs per 100,000 persons), one can see that d(QALY) is well-stabilized at simulation sizes at or above 30 million (Table B). Further, the cost-effectiveness strategy remained the same for all simulation sizes and the ICER stabilizes at a precision of $100,000 at or above 30 million (Table C). As a result, we utilized a simulation size of 30 million for the base case analysis.

eMethods Table B. Comparative clinical effectiveness across various simulation size

| Rank | PP | 12L | PPG | 1L | PM | Freq | d(QALY) at a given simulation cohort size (million) |
|------|----|-----|-----|----|----|------|-----------------------------------------------|
| 1    | X  | X   | X   | X  | X  | life | 0.00953 0.00956 0.00957 0.00970 0.01068 |
| 2    | X  | X   | X   | X  | X  | life | 0.00854 0.00892 0.00866 0.00869 0.01068 |
| 3    | X  | X   | X   | X  | X  | life | 0.00562 0.00586 0.00596 0.00591 0.00720 |
| 4    | X  | X   | X   | X  | X  | life | 0.00536 0.00551 0.00561 0.00531 0.00632 |
| 5    | X  | X   | X   | X  | X  | life | 0.00490 0.00486 0.00486 0.00405 0.00630 |
| 6    | X  | X   | X   | X  | X  | life | 0.00220 0.00253 0.00226 0.00161 0.00203 |
| 7    | X  | X   | once|    |    |      | 0.00049 0.00077 0.00093 0.00027 0.00089 |
| 8    | X  | X   | once|    |    |      | -0.0016 -0.0013 -0.0012 -0.0013 -0.0020 |

eMethods Table C. Cost-effectiveness results across various simulation size

| PP | 12L | PPG | 1L | PM | Freq | QALY | cost | ICER  |
|----|-----|-----|----|----|------|------|------|-------|
|    |     |     |    |    |      | 50 million |
| X  | X   | once|    |    |      | 7.09192 | 30174 | Reference |
| X  | X   |     |    |    |      | 7.10076 | 30666 | 55622  |
|    |     |     |    |    |      | 40 million |
| X  | X   | once|    |    |      | 7.09220 | 30167 | Reference |
| X  | X   |     |    |    |      | 7.10104 | 30670 | 56833  |
|    |     |     |    |    |      | 30 million |
| X  | X   | once|    |    |      | 7.09249 | 30169 | Reference |
| X  | X   |     |    |    |      | 7.10113 | 30669 | 57882  |
|    | X   |     |    |    |      | 20 million |
| X  | X   | once|    |    |      | 7.09249 | 30169 | Reference |
| X  | X   |     |    |    |      | 7.10113 | 30669 | 57882  |
|   |   | once  | 7.09257 | 30180 | Reference |
|---|---|-------|---------|-------|-----------|
|   |   | life  | 7.10137 | 30675 | 56273     |
|   |   |       | 10 million |     |           |
|   |   | once  | 7.09159 | 30192 | Reference |
|   |   | life  | 7.10138 | 30665 | 48325     |
**eTable 1. Disease Incidence (per 1000 Person-Years)**

|                       | Incidence of clinically recognized AF | Incidence of stroke (for no AF and no treatment group) | Incidence of stroke (for AF and no treatment group) | Incidence of intracranial hemorrhage |
|-----------------------|---------------------------------------|-------------------------------------------------------|----------------------------------------------------|------------------------------------|
|                       | < 55 years  | 55 to 64 years | 65 to 74 years | 75 to 84 years | ≥ 85 years | References | < 35 years  | 35 to 44 years | 45 to 54 years | 55 to 64 years | 65 to 74 years | 75 to 84 years | ≥ 85 years | References | CHA<sub>2</sub>DS<sub>2</sub>-VASc Score | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Male                  | 0.62 (0.62-0.76) | 4.34 (4.31-4.56) | 12.91 (9.24-14.33) | 24.52 (19.80-26.31) | 39.66 (15.69-46.81) | 9 |
| Female                | 0.19 (0.19-0.21) | 2.16 (1.10-3.70) | 6.79 (5.91-7.65) | 17.14 (14.40-17.69) | 27.69 (11.92-28.67) |
| Male                  | 0.03 (0-0.19)  | 0.27 (0.07-0.81) | 0.73 (0.33-1.38) | 1.77 (1.03-2.84) | 6.46 (4.70-8.68) | 9.42 (6.56-13.10) | 19.72 (11.49-31.58) |
| Female                | 0.06 (0-0.25)  | 0.16 (0.02-0.57) | 0.54 (0.05-1.17) | 1.75 (1.00-2.84) | 4.08 (2.71-5.89) | 10.51 (7.89-13.71) | 15.08 (10.17-21.52) |
| CHA<sub>2</sub>DS<sub>2</sub>-VASc Score | Base | Lower | Upper | References |  
| 0                     | 2 |  |  |  |  | 11 |
| 1                     | 6 |  |  |  |  |  |
| 2                     | 25 |  |  |  |  |  |
| 3                     | 37 |  |  |  |  |  |
| 4                     | 55 |  |  |  |  |  |
| 5                     | 84 |  |  |  |  |  |
| 6                     | 114 |  |  |  |  |  |
| 7                     | 131 |  |  |  |  |  |
| 8                     | 126 |  |  |  |  |  |
| 9                     | 144 |  |  |  |  |  |
| No treatment (converted from probability at 7.4y) | Base | Lower | Upper | References |  
| Aspirin | 0.95 | 0.95<sup>12</sup> | 4 | 12,13 |
| Warfarin | 7.8 (WA) | 3.3<sup>14</sup> | 8.5<sup>15</sup> | 14–17 |
| DOAC | 3.99 (WA) | 3.3<sup>14</sup> | 5.0<sup>17</sup> | 14–17 |
|                | Base     | Lower   | Upper   | References |
|----------------|----------|---------|---------|------------|
| **Incidence of major hemorrhage** |          |         |         |            |
| No treatment   | 1.64<sup>19</sup> | 0.467   | 1.64    | <sup>19,20</sup> |
| Aspirin        | 2.31<sup>19</sup> | 1.92<sup>19</sup> | 8.0<sup>21</sup> | <sup>19,21</sup> |
| Warfarin       | 31.2 (WA) | 16.9<sup>14</sup> | 34.3<sup>15</sup> | <sup>14-17</sup> |
| DOAC           | 29.0 (WA) | 9.6<sup>14</sup> | 36.0<sup>17</sup> | <sup>14-17</sup> |
| OAC+aspirin    | 43.0     |         |         | <sup>18</sup> |

|                | Base     | Lower   | Upper   | References |
|----------------|----------|---------|---------|------------|
| **Incidence of clinically relevant non-major hemorrhage** |          |         |         |            |
| No treatment   | 2.9 (A)  | 2.2<sup>22</sup> | 3.6<sup>23</sup> | <sup>22,23</sup> |
| Aspirin (converted from probability at 2.3y) | 5.61     |         |         | <sup>24</sup> |
| Warfarin       | 107.1 (WA) | 101.5<sup>15</sup> | 114.0<sup>17</sup> | <sup>15,17</sup> |
| DOAC           | 102.2 (WA) | 86.7    | 118.0   | <sup>15,17</sup> |
| OAC+aspirin (HR versus warfarin) | 1.19     | 0.36    | 4.17    | <sup>18</sup> |
### eTable 2. Comorbidity Prevalence/Incidence (per 1000 Person-Years)

#### Incidence of heart failure

| Age Group | Male          | Female        | References |
|-----------|---------------|---------------|------------|
| 55-64 years | 3.9 (3.9-11.2) | 2.7 (2.7-8.2) | 25,26      |
| 65-69 years | 7.4 (6.4-8.5)  | 5.1 (4.3-5.9) |            |
| 70-74 years | 10.8 (9.2-12.5) | 10.2 (8.8-11.6) | |
| 75-79 years | 16.9 (14.3-19.5) | 14.4 (12.3-16.5) | |
| 80-84 years | 29.4 (24.1-34.8) | 23.2 (19.5-26.8) | |
| ≥85 years   | 45.6 (35.3-55.8) | 41.1 (34.8-47.4) | |

Defined using presence of Framingham heart failure criteria.²⁷

#### Prevalence of heart failure

| Age Group | Male | Female | References |
|-----------|------|--------|------------|
| 20-39 years | 0.3  | 0.2    | 25         |
| 40-59 years | 1.2  | 1.7    |            |
| 60-79 years | 6.9  |        |            |
| ≥80 years   | 12.8 |        |            |

Defined using NHANES 2013-2016 health interviews. Heart failure was considered present if a person reported “yes” to being told by a healthcare professional that he or she had heart failure.

#### Incidence of hypertension

| Age Group | Male          | Female        | References |
|-----------|---------------|---------------|------------|
| 20-29 years | 8.15 (5.5-10.0) | 3.3 (2.0-4.6) | 28         |
| 30-39 years | 16.6 (1.3-75.0) | 7.7 (6.8-33.0) | |
| 40-49 years | 21.9 (3.9-71.0) | 18.0 (16.1-57.0) | |
| 50-59 years | 23.6 (8.7-91.0) | 24.9 (32.4-66.0) | |
| 60-69 years | 28.0 (10.2-88.6) | 34.7 (42.6-95.8) | |
| 70-79 years | 31.1          | 42.8          |            |

Defined using systolic blood pressure ≥ 160mmHg or diastolic blood pressure ≥ 95mmHg on two consecutive measurements, or use of anti-hypertensive medication.

#### Prevalence of hypertension

| Age Group | Male | Female | References |
|-----------|------|--------|------------|
| 20-34 years | 25.7 | 13.0   |            |
| 35-44 years | 42.5 | 31.6   |            |
| 45-54 years | 56.3 | 49.7   |            |
| 55-64 years | 66.4 | 64.9   |            |
| 65-74 years | 70.8 | 77.8   |            |
| ≥75 years   | 80.0 | 85.6   |            |

Defined using NHANES 2013-2016 blood pressure measurements and health interviews. Hypertension was considered present if a person had systolic blood pressure ≥ 130mmHg or diastolic blood pressure ≥ 80mmHg, reported “yes” to taking anti-hypertensive medication, or reported “yes” to being told by a healthcare professional that he or she had hypertension on at least two occasions.

#### Incidence of diabetes

| Age Group | Male | Female | References |
|-----------|------|--------|------------|
| ≥20 years |      |        |            |
| Male | 4.15 (4.15-6.15) | 29 |
| Female | 2.70 (2.70-6.79) |

Defined as fasting glucose ≥ 126 mg/dL, 2-hour post-challenge glucose ≥ 200 mg/dL, random glucose ≥ 200 mg/dL with presence of hyperglycemia symptoms, hemoglobin a1c ≥ 6.5%

### Prevalence of diabetes

| Male | ≥20 years | References |
| 15.5 | 25 |
| Female | 11.7 |

Defined as fasting glucose ≥ 126 mg/dL, 2-hour post-challenge glucose ≥ 200 mg/dL, hemoglobin a1c ≥ 6.5%, or use of anti-glycemic medications

### Incidence of myocardial infarction (MI)

| Male | 35-44 years | 45-54 years | 55-64 years | 65-74 years | ≥ 75 years | References |
| 0.79 (0.79-2.35) | 2.14 (2.14-4.01) | 3.82 (3.82-7.05) | 7.26 (7.26-10.67) | 9.39 (9.39-15.9) |
| Female | 0.27 (0.27-1.05) | 0.99 (0.99-2.70) | 2.10 (2.10-4.35) | 3.69 (3.69-7.70) | 8.53 (8.53-12.0) |

Defined using the Atherosclerosis Risk in Communities Study acute myocardial infarction surveillance definition

### Prevalence of MI

| Male | 20-39 years | 40-59 years | 60-79 years | ≥ 80 years | References |
| 0.1 | 2.8 | 11.5 | 17.3 |
| Female | 0.4 | 2.1 | 4.2 | 12.7 |

Defined using NHANES 2013-2016 health interviews. Myocardial infarction was considered present if a person reported “yes” to being told by a healthcare professional that he or she ever had a heart attack or myocardial infarction.

### Incidence of peripheral arterial disease (PAD)

| Overall | 50-59 years | 60-69 years | 70-79 years | ≥ 80 years | References |
| 1.0 | 2.0 | 2.8 | 3.5 | 31 |
| Female (vs. Male) | Relative risk/incidence ratio: 0.538 |

Defined using presence of Read diagnosis codes indicative of a symptomatic PAD diagnosis or related revascularization procedures
### Prevalence of PAD

| Age Group | Male | Female |
|-----------|------|--------|
| 40-49 years | 1.4 (0.2-2.6) | 1.9 (0-3.0) |
| 50-59 years | 1.9 (0.9-5.0) | 4.3 (0.4-4.3) |
| 60-69 years | 5.4 (3.5-13.2) | 5.1 (0.7-8.9) |
| 70-79 years | 9.2 (9.2-24.4) | 7.9 (6.9-20.0) |
| ≥ 80 years | 22.6 (21.5-59.0) | 18.2 (18.2-35.1) |

Defined using ankle-brachial index < 0.9 or previous revascularization for PAD

### Incidence of coronary disease (including both MI and non-MI CAD)

| Age Group | Male | Female |
|-----------|------|--------|
| 35-54 years | 2.06 | 0.57 |
| 55-69 years | 6.33 | 2.82 |
| ≥70 years | 15.5 | 9.52 |

Defined using International Classification of Diseases, 9th revision (ICD-9) and ICD, 10th revision (ICD-10) codes: 410-414, I21-I25 applied to hospital admission data and cause of death register

### Prevalence of coronary disease

| Age Group | Male | Female |
|-----------|------|--------|
| 20-39 years | 0.5 | 1.0 |
| 40-59 years | 6.1 | 6.2 |
| 60-79 years | 19.7 | 12.6 |
| ≥ 80 years | 31.0 | 25.4 |

Defined using NHANES 2013-2016 health interviews. Coronary heart disease was considered present if a person reported "yes" to being told by a healthcare professional that he or she had coronary heart disease, angina or angina pectoris, heart attack, or myocardial infarction. Those who answered "no" but were diagnosed with angina based on the Rose questionnaire were also included.

### Conditional prevalence

| Condition | Value | References |
|-----------|-------|------------|
| Prevalence (PAD | non-MI CAD) | 0.141 | 33 |
| Prevalence (PAD | MI) | 0.048 | 34–36 |
| Prevalence (PAD | no CAD) | 0.0090 | |
| Prevalence (non-MI CAD | PAD) | 0.109 | 38 |
| Prevalence (MI | PAD) | 0.182 | 38 |

© 2022 Chen W et al. JAMA Health Forum.
**eTable 3. Disease Recurrence Rates (Monthly Probabilities)**

|                        | Base       | Lower      | Upper      | References |
|------------------------|------------|------------|------------|------------|
| **Ischemic stroke**    |            |            |            |            |
| No treatment           |            |            |            |            |
| First year             | 0.0115     | 0.00874    | 0.0144     | 39         |
| Subsequent years       | 0.00348    | 0.00141    | 0.00668    | 39         |
| Aspirin                |            |            |            |            |
| First year             | 0.009      |            |            | Use RR     |
| Subsequent years       | 0.003      |            |            | Use RR     |
| OAC (with or without aspirin) |        |            |            |            |
| First year             | 0.004      |            |            | Use RR     |
| Subsequent years       | 0.001      |            |            | Use RR     |
| **Intracranial hemorrhage** |        |            |            |            |
| First year             | 0.0135     |            |            | 40         |
| Subsequent years       | Baseline incidence |         |            |
eTable 4. Disease-Related Mortality (Monthly Probabilities)

| Disease                                                                 | Base | Lower | Upper | References |
|------------------------------------------------------------------------|------|-------|-------|------------|
| **Ischemic stroke (30-day, AF)**                                       |      |       |       | 41         |
| Mild                      | 0.01 |       |       |            |
| Moderate                  | 0.13 |       |       |            |
| Severe                    | 0.39 |       |       |            |
| **Ischemic stroke (first year among 30-day survivors, no AF)**         |      |       |       | 41         |
| Mild                      | 0    |       |       | Assumption |
| Moderate-severe           | Use RR |     |       |            |
| **Ischemic stroke (first year among 30-day survivors, AF)**            |      |       |       | 42         |
| Mild                      | 0    |       |       | Assumption |
| Moderate-severe           | 0.026|       |       |            |
| **Ischemic stroke (subsequent years among 1-year survivors, no AF)**   |      |       |       | 42         |
| Mild                      | 0    |       |       | Assumption |
| Moderate-severe           | Use RR |     |       |            |
| **Ischemic stroke (subsequent years among 1-year survivors, AF)**      |      |       |       | 42         |
| Mild                      | 0    |       |       | Assumption |
| Moderate-severe           | 0.0077|      |       |            |
| **Relative risk of ischemic stroke mortality (AF versus no AF)**        |      |       |       | 42,43      |
|                          | 1.63 | 1.25  | 2.00  |            |
| **Intracranial hemorrhage (disabling)**                                |      |       |       | 44         |
| 30-day probability of death (aspirin or no treatment)                  | 0.35 | 0.332 | 0.374 |            |
| Odds ratio for death at 30 days (OAC or OAC+aspirin)                  | 3    | 1.9   | 4.7   | 45         |
| First and Subsequent years among 30-day survivors                      | 0.01575 | |       | 46         |
| **Major hemorrhage**                                                  |      |       |       | 47         |
| No treatment                                                          | 0.091|       |       |            |
| Aspirin                   | 0.078|       |       |            |
| Warfarin                  | 0.14 | 0.112 | 0.206 |            |

© 2022 Chen W et al. JAMA Health Forum.
|                | DOAC 0.082 | 0.068 | 0.104 | 14,15,17 |
|----------------|-----------|-------|-------|----------|
| OAC+Aspirin    | 0.11      |       |       | Assumption |
### eTable 5. Severity Measures

|                         | Base | Lower | Upper | References |
|-------------------------|------|-------|-------|------------|
| **Ischemic Stroke**     |      |       |       |            |
| **No AF, No Treatment** |      |       |       |            |
| Proportion of ischemic strokes that are mild (mRS 0-2) | 0.47 | 0.375 | 0.575 | 49         |
| Proportion of ischemic strokes that are moderate (mRS 3-4) | 0.405 | 0.3 | 0.5 | 49         |
| Proportion of ischemic strokes that are severe or fatal (mRS 5-6) | 0.125 | 0.07 | 0.16 | 49         |
| **AF, No Treatment**   |      |       |       |            |
| Proportion of ischemic strokes that are mild (mRS 0-2) | 0.363 | 0.3 | 0.45 | 49         |
| Proportion of ischemic strokes that are moderate (mRS 3-4) | 0.364 |     |     | 49         |
| Proportion of ischemic strokes that are severe or fatal (mRS 5-6) | 0.273 |     |     | 49         |
| **AF, on OAC**          |      |       |       |            |
| Proportion of ischemic strokes that are mild (mRS 0-2) | 0.47 |       |       | 41         |
| Proportion of ischemic strokes that are moderate (mRS 3-4) | 0.42 |       |       | 41         |
| Proportion of ischemic strokes that are severe or fatal (mRS 5-6) | 0.11 |       |       | 41         |
| **Intracranial hemorrhage** | |       |       |            |
| Proportion of intracranial hemorrhages that are nondisabling | 0.26 | 0.12 | 0.39 | 44         |
### eTable 6. Utilities

| Condition                        | Base | Lower | Upper | References |
|----------------------------------|------|-------|-------|------------|
| **Atrial Fibrillation**          |      |       |       |            |
| Asymptomatic*                    | 0.954|       |       |            |
| Symptomatic                      | 0.81 | 0.68  | 0.91  | 51         |
| **Ischemic stroke**              |      |       |       |            |
| Mild stroke (mRS 0-2)            | 0.89 | 0.80  | 0.93  | 49         |
| Moderate stroke (mRS 3-4, first year) | 0.67 | 0.56  | 0.71  | 49         |
| Moderate stroke (mRS 3-4, subsequent years) | 0.71 | 0.67  | 0.80  | 49         |
| Severe or fatal stroke (mRS 5-6, first year) | 0.30 | 0.20  | 0.40  | 49         |
| Severe stroke (mRS 5, subsequent years) | 0.48 | 0.30  | 0.60  | 49         |
| **Intracranial hemorrhage**      |      |       |       |            |
| Nondisabling                     | 0.89 |       |       | 49         |
| Disabling (first year)           | 0.42 |       |       | 49         |
| Disabling (subsequent years)     | 0.55 |       |       | 49         |
| **Major bleeding**               |      |       |       |            |
| 1 month                          | 0.8  |       |       | 49         |
| **Therapeutics (while receiving)** |      |       |       |            |
| Warfarin                         | 0.987| 0.953 | 1.0   | 52         |
| Novel oral anticoagulants        | 0.994| 0.993 | 0.996 | 53         |
| Aspirin                          | 0.998| 0.994 | 1     | 52         |

*Proportion of AF that is asymptomatic estimated to be 12%*
eTable 7. Costs

| Treatment-related cost                       | Base     | Range         | Reference |
|----------------------------------------------|----------|---------------|-----------|
| Warfarin drug cost (monthly)                  | 15.4     | 10.4-68.4     | 55        |
| Warfarin INR testing (monthly)                | 7.9      | 2.6-15.8      | 55        |
| MD visit (annual)                             | 76.2     | 52.3-83.2     | 56        |
| NOAC Drug cost (monthly)                      | 289.0    | 148.6-399.5   | 55        |
| OAC Drug cost (monthly)                       |          | Weighted average of Warfarin and NOAC drug cost   |
| OAC INR testing (monthly)                     |          | Warfarin INR testing cost scaled by proportion taking warfarin |
| MD visit (annual)                             | 76.2     | 52.3-83.2     | 56        |

| Ischemic stroke (IS)-related cost             |          |               |           |
| Upfront (first month)                         |          |               |           |
| Mild IS (mRS 0-2)                             | 11917    | 10712-15000   | 57        |
| Moderate IS (mRS 3-4)                         | 17885    | 15009-19120   | 57        |
| Severe IS (mRS 5-6)                           | 22648    | 19442-32360   | 57        |
| Maintenance (starting from 2nd month, monthly)|          |               |           |
| Mild IS (mRS 0-2)                             | 650      | 570-729       | 58        |
| Moderate IS (mRS 3-4)                         | 2355     | 1247-3463     | 58        |
| Severe IS (mRS 5-6)                           | 4824     | 2355-7292     | 58        |

| Intracranial hemorrhage (ICH)-related cost    |          |               |           |
| Upfront (first month)                         |          |               |           |
| Non-disabling ICH                             | 24961    | 16646-37163   | 57        |
| Disabling ICH                                 | 78897    | 53526,116485  | 57        |
| Maintenance (starting from 2nd month, monthly)|          |               |           |
| Non-disabling ICH                             | 1746     | 1397-2095 (+/20%) | 58 |
| Disabling ICH                                 | 3127     | 2502-3752 (+/10%) | 58 |

| Major bleed-related cost                      |          |               |           |
| Upfront (first month)                         | 11801    | 6703,45612    | 57        |

© 2022 Chen W et al. JAMA Health Forum.
| Minor bleed-related cost | Upfront (first month) | 148.3 | 113.7-162.1 | 56 |
|--------------------------|-----------------------|-------|-------------|----|
| Screening-related cost   |                       |       |             |    |
| PP                       | 0.78                  |       | 0.31-0.85   | 56 |
| 1-lead ECG               | 14.7                  |       | 12.5-14.7   | 59 |
| 12-lead ECG              | 17.3                  |       | 17.3-32     | 56 |
| PM                       | 159                   |       | 159-199     | 60 |
| watch                    | 232.5                 |       |             |    |
| MD visit (at confirmatory)| 76.2                  |       | 52.3-83.2   | 56 |
| RN visit (at initial and transition from watch to PM) | 23.5 |       | 9.4-25.6    | 56 |

INR = International Normalized Ratio; IS = ischemic stroke; ICH = intracranial hemorrhage; NOAC = novel oral anticoagulant; OAC = oral anticoagulant; mRS = modified Rankin score. All costs have been adjusted to 2020 US dollars.61,62
### eTable 8. Summary of Parameters Included in Sensitivity Analyses

| Parameter | Included in one-way sensitivity analysis | Included in probability sensitivity analysis (PSA) | Distribution(s) utilized in PSA |
|-----------|-----------------------------------------|-----------------------------------------------|---------------------------------|
| **Incidence rates** | | | |
| Atrial fibrillation | X | X | Log-normal, beta |
| Ischemic stroke (AF) | X | X | Log-normal, beta |
| Ischemic stroke (non-AF) | X | X | Log-normal, beta |
| Intracranial hemorrhage | X | X | Log-normal, beta |
| Major hemorrhage | X | X | Log-normal, beta |
| Recurrent stroke | X | | Log-normal, beta |
| Mortality | | | |
| Ischemic stroke | X | X | Beta |
| Intracranial hemorrhage | X | X | Beta |
| Major hemorrhage | X | | Beta |
| **Severity** | | | |
| Ischemic stroke | X | | Beta |
| Intracranial hemorrhage | X | | Beta |
| **Other clinical factors** | | | |
| Proportion of AF that is undiagnosed | X | X | Beta |
| Proportion of AF that is persistent | X | X | Beta |
| Average AF burden in paroxysmal AF | X | X | Beta |
| Proportion of OAC that is DOAC | X | X | Beta |
| OAC discontinuation rate | X | X | Beta |
| Patch monitor adherence | X | X | Triangular |
| Effect of OAC on ischemic stroke | X | X | Beta |
| **Test characteristics** | | | |
| Pulse palpation | X | X | Beta |
| Single-lead ECG | X | X | Beta |
| Patch monitor | X | X | Beta, Triangular |
| 12-lead ECG | X | X | Beta |
| Smart watch/band PPG | X | X | Beta |
| Smart watch/band ECG | X | X | Beta |
| **Utilities** | | | |
| AF | X | X | Beta |
| Ischemic stroke | X | X | Beta |
| OAC | X | X | Beta |
| Aspirin | X | X | Beta |
| **Costs** | | | |
| Drug-related cost | X | X | Gamma |
| MD visit cost | X | X | Gamma |
| RN visit cost | X | X | Gamma |
| Ischemic stroke-related cost | X | X | Gamma |
| Intracranial hemorrhage-related cost | X | X | Gamma |
| Major bleed-related cost | X | X | Gamma |
| Pulse palpation cost | X | X | Gamma |
| Single-lead ECG cost | X | X | Triangular |
| 12-lead ECG cost | X | X | Gamma |
| Patch monitor cost | X | X | Triangular |
eTable 9. Summary of Costs Associated With Each Screening Strategy

| Strategy  | Screening Cost ($) | Treatment Cost ($) | Bleeding-related Cost ($) | Stroke-related Cost ($) | Overall Cost ($) |
|-----------|--------------------|-------------------|--------------------------|-------------------------|-----------------|
| PP 12L PPG 1L PM freq |                    |                   |                          |                         |                 |
| X X       | 45.00              | 1,197.90          | 2,748.80                 | 26,190.60               | 30,182.30       |
| X X X     | 614.40             | 1,216.10          | 2,807.00                 | 26,044.90               | 30,682.50       |
| No screening | 19.20             | 1,131.80          | 2,702.90                 | 26,370.90               | 30,224.80       |
| X         | 57.80              | 1,272.60          | 2,794.60                 | 26,160.60               | 30,285.70       |
| X X X     | 583.30             | 1,350.50          | 2,886.00                 | 26,007.70               | 30,827.50       |
| X X X     | 578.70             | 1,281.90          | 2,841.20                 | 26,033.20               | 30,735.00       |
| X X       | 581.20             | 1,257.30          | 2,856.60                 | 26,034.80               | 30,729.90       |
| X X X     | 616.00             | 1,310.80          | 2,836.60                 | 26,008.80               | 30,772.20       |
| X X X X X | 611.90             | 1,240.40          | 2,800.50                 | 26,045.40               | 30,698.20       |

Costs presented per simulated individual.
**eTable 10. True and False Positive Rates by Strategy**

| Strategy | Total number of individuals with AF (millions) | True AF cases detected (millions) | False AF diagnoses made (millions) | Total AF diagnoses made (millions) | AF incidence rate (per 1,000 person-yr) | AF true positive rate (%) | AF false positive rate (%) |
|----------|-----------------------------------------------|----------------------------------|-----------------------------------|-----------------------------------|------------------------------------------|----------------------------|--------------------------|
| PP 12L   | 10.760                                        | 8.768                            | 0.076                             | 8.844                             | 25.592                                    | 81.5                       | 0.4                      |
| PP X X X  | 10.767                                        | 8.793                            | 0.139                             | 8.932                             | 25.588                                    | 81.7                       | 0.7                      |
| PP X X X  | 10.769                                        | 8.831                            | 0.405                             | 9.237                             | 25.581                                    | 82.0                       | 2.1                      |
| PP X X X  | 10.779                                        | 8.815                            | 0.275                             | 9.091                             | 25.574                                    | 81.8                       | 1.4                      |
| PP X X X  | 10.790                                        | 8.842                            | 0.337                             | 9.180                             | 25.571                                    | 81.9                       | 1.8                      |
| PP X X X  | 10.792                                        | 8.879                            | 0.601                             | 9.479                             | 25.570                                    | 82.3                       | 3.1                      |
| PP X X once | 10.796                                      | 8.533                            | 0.135                             | 8.668                             | 25.593                                    | 79.0                       | 0.7                      |
| PP X X once | No screening                                | 10.797                          | 8.230                            | 0.072                             | 8.372                                    | 25.597                     | 76.9                     | 0.4                      |
| PP X X once | 10.793                                      | 8.604                            | 0.401                             | 9.006                             | 25.598                                    | 79.7                       | 2.1                      |

*False positive rate in no screening condition attributable to application of patch monitor following stroke events*
**eTable 11. Cost-effectiveness Results for Scenario Analyses**

|       | PP | 12L | PPG | 1L | PM | freq | Quality-adjusted life-years (QALY) | Cost ($) | Incremental Cost-effectiveness Ratio ($/QALY) |
|-------|----|-----|-----|----|----|------|-----------------------------------|---------|---------------------------------|
|       |    |     |     |    |    |      |                                   |         |                                 |
|       |    |     |     |    |    |      |                                   |         |                                 |
| **Cost of wrist-worn wearable = $150** |    |     |     |    |    |      |                                   |         |                                 |
| X     | X  |     |     |    |    |      | Once                             | 7.09249 | 30,182                          |
|       | X  | X   |     |    |    |      | Life                             | 7.10113 | 30,481                          |
|       |    |     |     |    |    |      | No screening                     | 7.09156 | 30,225                          |
| X     |    |     |     |    |    |      | Once                             | 7.09040 | 30,286                          |
|       | X  | X   |     |    |    |      | Life                             | 7.09382 | 30,656                          |
|       | X  | X   | X   |    |    |      | Life                             | 7.09642 | 30,561                          |
|       | X  | X   | X   | X  |    |      | Life                             | 7.09717 | 30,555                          |
| X     | X  | X   | X   | X  | X  |      | Life                             | 7.10022 | 30,499                          |
| **Cost of wrist-worn wearable = $200** |    |     |     |    |    |      |                                   |         |                                 |
| X     | X  |     |     |    |    |      | Once                             | 7.09249 | 30,182                          |
|       | X  | X   |     |    |    |      | Life                             | 7.10113 | 30,603                          |
|       |    |     |     |    |    |      | No screening                     | 7.09156 | 30,225                          |
| X     |    |     |     |    |    |      | Once                             | 7.09040 | 30,286                          |
|       | X  | X   |     |    |    |      | Life                             | 7.09382 | 30,656                          |
|       | X  | X   | X   | X  |    |      | Life                             | 7.09642 | 30,760                          |
|       | X  | X   | X   | X  | X  |      | Life                             | 7.09717 | 30,661                          |
| X     | X  | X   | X   | X  | X  |      | Life                             | 7.10022 | 30,620                          |
| **Cost of wrist-worn wearable = $250** |    |     |     |    |    |      |                                   |         |                                 |
| X     | X  |     |     |    |    |      | Once                             | 7.09249 | 30,182                          |
|       | X  | X   |     |    |    |      | Life                             | 7.10113 | 30,725                          |
|       |    |     |     |    |    |      | No screening                     | 7.09156 | 30,225                          |
| X     |    |     |     |    |    |      | Once                             | 7.09040 | 30,286                          |
|       | X  | X   |     |    |    |      | Life                             | 7.09382 | 30,864                          |
|       | X  | X   | X   | X  |    |      | Life                             | 7.09642 | 30,772                          |
|       | X  | X   | X   | X  | X  |      | Life                             | 7.09717 | 30,767                          |
| X     | X  | X   | X   | X  | X  |      | Life                             | 7.10022 | 30,741                          |
| **Cost of wrist-worn wearable = $300** |    |     |     |    |    |      |                                   |         |                                 |
| X     | X  |     |     |    |    |      | Once                             | 7.09249 | 30,182                          |
|       | X  | X   |     |    |    |      | Life                             | 7.10113 | 30,847                          |
|       |    |     |     |    |    |      | No screening                     | 7.09156 | 30,225                          |

© 2022 Chen W et al. *JAMA Health Forum.*
| Daily wear time of wrist-worn wearable = 6 hours | Once    | 7.09249 | 30,182 | Reference |
|-------------------------------------------------|---------|---------|--------|------------|
| No screening                                    |         | 7.09156 | 30,225 | Strongly dominated |
| X                                               |         | 7.09040 | 30,286 | Strongly dominated |
| X X                                              | Life    | 7.09363 | 30,825 | Strongly dominated |
| X X X                                             | Life    | 7.09596 | 30,733 | Strongly dominated |
| X X X X                                           | Life    | 7.09714 | 30,735 | Strongly dominated |
| X X X X X                                        | Life    | 7.09739 | 30,765 | Strongly dominated |
| X X X X X X                                      | Life    | 7.10033 | 30,697 | Strongly dominated |
| Daily wear time of wrist-worn wearable = 12 hours | Once    | 7.09249 | 30,182 | Reference |
| No screening                                    |         | 7.09156 | 30,225 | Strongly dominated |
| X                                               |         | 7.09040 | 30,286 | Strongly dominated |
| X X X                                             | Life    | 7.09363 | 30,825 | Strongly dominated |
| X X X X                                           | Life    | 7.09632 | 30,732 | Strongly dominated |
| X X                                               | Life    | 7.09739 | 30,769 | Strongly dominated |
| X X X X X                                        | Life    | 7.10066 | 30,702 | Strongly dominated |
| Daily wear time of wrist-worn wearable = 24 hours | Once    | 7.09249 | 30,182 | Reference |
| No screening                                    |         | 7.09156 | 30,225 | Strongly dominated |
| X                                               |         | 7.09040 | 30,286 | Strongly dominated |
| X X X                                             | Life    | 7.09363 | 30,826 | Strongly dominated |
| X X X X                                           | Life    | 7.09652 | 30,735 | Strongly dominated |
| X X                                               | Life    | 7.09725 | 30,729 | Strongly dominated |
| X X X X X                                        | Life    | 7.09759 | 30,776 | Strongly dominated |
| X X X X X X                                      | Life    | 7.10039 | 30,697 | Strongly dominated |

Men

| Once    | 6.83680 | 30,778 | Reference |
|---------|---------|--------|------------|
| X X X X | Life    | 6.84374 | 31,197 | 60,375    |

© 2022 Chen W et al. JAMA Health Forum.
| No screening | 6.83538 | 30,829 | Strongly dominated |
|--------------|---------|--------|--------------------|
| X            |         |        |                    |
| X X          | 6.83545 | 30,864 | Strongly dominated |
| X X X        | 6.83793 | 31,344 | Strongly dominated |
| X X X X X    | 6.83977 | 31,250 | Strongly dominated |
| X X X X X X  | 6.84108 | 31,236 | Strongly dominated |
| X X X X X X  | 6.84333 | 31,282 | Strongly dominated |

| No screening | 7.34786 | 29,621 | Strongly dominated |
|--------------|---------|--------|--------------------|
| X            |         |        |                    |
| X X          | 7.35847 | 30,168 | Strongly dominated |
| X X X        | 7.34980 | 30,311 | Strongly dominated |
| X X X X X    | 7.35211 | 30,224 | Strongly dominated |
| X X X X X X  | 7.35406 | 30,263 | Strongly dominated |

| No screening | 7.34786 | 29,621 | Strongly dominated |
|--------------|---------|--------|--------------------|
| X            |         |        |                    |
| X X          | 7.35847 | 30,168 | Strongly dominated |
| X X X        | 7.34980 | 30,311 | Strongly dominated |
| X X X X X    | 7.35211 | 30,224 | Strongly dominated |
| X X X X X X  | 7.35406 | 30,263 | Strongly dominated |

| Specificity of W-ECG = 80% |
|---------------------------|
| X X          | 7.09249 | 30,182 | Reference          |
| X X X        | 7.09988 | 30,698 | 69,891             |
| No screening  |         |        |                    |
| X            |         |        |                    |
| X X          | 7.09156 | 30,225 | Strongly dominated |
| X X X        | 7.09040 | 30,286 | Strongly dominated |
| X X X X X    | 7.09642 | 30,735 | Strongly dominated |
| X X X X X X  | 7.09700 | 30,788 | Strongly dominated |

| Specificity of W-ECG = 85% |
|---------------------------|
| X X          | 7.09249 | 30,182 | Reference          |
| X X X        | 7.10045 | 30,691 | 63,945             |
| No screening  |         |        |                    |
| X            |         |        |                    |
| X X          | 7.09156 | 30,225 | Strongly dominated |
| X X X        | 7.09040 | 30,286 | Strongly dominated |
| X X X X X    | 7.09642 | 30,735 | Strongly dominated |
| X X X X X X  | 7.09700 | 30,788 | Strongly dominated |

| Specificity of W-PPG = 80% |
|---------------------------|
| X X          | 7.09249 | 30,182 | Reference          |
| Screening | Frequency | Sensitivity | Specificity |
|-----------|-----------|-------------|-------------|
| X X X X   | Life      | 7.10029     | 7.09156     |
| X X X X   | Life      | 7.09040     | 7.08290     |
| X X X X   | Life      | 7.08525     | 7.08291     |
| X X X X   | Life      | 7.09677     | 7.09904     |
| X X X X   | Life      | 7.09249     | 7.09156     |
| No screening |          | 7.09249     | 7.09156     |

Specificity of W-PPG = 85%

| Screening | Frequency | Sensitivity | Specificity |
|-----------|-----------|-------------|-------------|
| X X       | Once      | 7.09249     | 7.09156     |
| X X X X   | Life      | 7.10008     | 7.08331     |
| X X X X   | Life      | 7.08583     | 7.08297     |
| X X X X   | Life      | 7.09695     | 7.09903     |
| No screening |          | 7.09249     | 7.09156     |

Sensitivity of W-PPG = 80%

| Screening | Frequency | Sensitivity | Specificity |
|-----------|-----------|-------------|-------------|
| X X       | Once      | 7.09249     | 7.09156     |
| X X X X   | Life      | 7.10115     | 7.09383     |
| X X X X   | Life      | 7.09632     | 7.09738     |
| X X X X   | Life      | 7.10059     | 7.09767     |
| No screening |          | 7.09249     | 7.09156     |

Sensitivity of W-PPG = 85%

| Screening | Frequency | Sensitivity | Specificity |
|-----------|-----------|-------------|-------------|
| X X       | Once      | 7.09249     | 7.09156     |
| X X X X   | Life      | 7.10111     | 7.09383     |
| X X X X   | Life      | 7.09632     | 7.09738     |
| X X X X   | Life      | 7.10059     | 7.09767     |
| No screening |          | 7.09249     | 7.09156     |

© 2022 Chen W et al. JAMA Health Forum.
| Parameter | Value | ICER |
|-----------|-------|------|
| baseline diagnosis rate | 0.67 | * 52809 |
| | 0.73 | * 57208 |
| proportion of AF that is persistent | 0.04 | * 53815 |
| | 0.66 | * 55392 |
| paroxysmal AF burden | 0.011 | * 58523 |
| | 0.17 | * 57796 |
| proportion of OAC that is NOAC (vs. Warfarin) | 0.10 | * 55253 |
| | 0.50 | * 61474 |
| probability of Warfarin discontinuation (monthly) | 0.007 | * 59767 |
| | 0.042 | * 71576 | 57270 |
| RR of NOAC discontinuation (vs. Warfarin) | 0.57 | * 56314 |
| | 0.84 | * 58784 |
| utility of symptomatic AF | 0.68 | * 49770 |
| | 0.91 | * 66075 |
| RR of ischemic stroke for AF patients (OAC vs. placebo) | 0.23 | * 50594 |
| | 0.46 | * 56193 |
| RR of ischemic stroke for non-AF patients (OAC vs. placebo) | 0.44 | * 58247 |
| | 0.76 | * 56950 |
|                                      |       |       |       |
|--------------------------------------|-------|-------|-------|
| Uptake of patch monitor              | 0.62  | *     | 59904 |
| major bleeding incidence rate        |       |       |       |
| with Warfarin                        | 16.9  | *     | 54938 |
|                                     | 34.3  | *     | 55721 |
| major bleeding incidence rate        |       |       |       |
| with NOAC                            | 9.6   | *     | 61361 |
|                                     | 36.0  | *     | 56563 |
| ICH incidence rate                   |       |       |       |
| with Warfarin                        | 3.3   | *     | 58086 |
|                                     | 8.5   | *     | 57438 |
| ICH incidence rate                   |       |       |       |
| with NOAC                            | 3.3   | *     | 57807 |
|                                     | 5.0   | *     | 57722 |
| severe ischemic stroke               |       |       |       |
| 30-day all-cause mortality           | 0.312 | *     | 54415 |
|                                     | 0.468 | *     | 58718 |
| OR of 30-day all-cause mortality     |       |       |       |
| for ICH (OAC vs. placebo)            | 1.9   | *     | 57396 |
|                                     | 4.7   | *     | 57861 |
| 12L ECG sensitivity                  | 81.0  | *     | 56968 |
|                                     | 100.0 | *     | 59107 |
| 12L ECG specificity                  | 76.0  | *     | 47822 |
|                                     | 100.0 | *     | 65428 |
|                                     |       | 18911 |
| watch PPG sensitivity                | 92.0  | *     | 58227 |
|                                     | 97.4  | *     | 57506 |
| watch PPG specificity                | 89.7  | *     | 65890 |
|                                     | 100.0 | *     | 56610 |
| watch ECG sensitivity                | 76.7  | *     | 57617 |
|                                     | 98.3  | *     | 59815 |
| watch ECG specificity                | 89.6  | *     | 59112 |
|                                     | 100.0 | *     | 58038 |
| patch monitor sensitivity            | 90.0  | *     | 59306 |
| patch monitor specificity            | 86.9  | *     | 59798 |
|                                     | 100.0 | *     | 57450 |
|                                     | 16.0  | *     | 50504 |
|                                | Value   | Notes   |
|--------------------------------|---------|---------|
| **Pulse palpation sensitivity**| 100.0   | * 59893 |
| **Pulse palpation specificity**| 65.0    | * 49937 |
|                                | 91.0    | * 57383 |
| **RR of ischemic stroke**      | 1.00    | * 50746 |
| (paroxysmal vs. persistent AF) | 0.01    | *       |
| **RR of ischemic stroke**      | 0.94    | * 56017 |
| for AF patients                | 0.65    | * 56637 |
| (aspirin vs. placebo)          |         |         |
| **Warfarin monthly drug cost** | 10.4    | * 57817 |
|                                | 68.4    | * 58687 |
| **INR testing cost**           | 2.6     | * 57813 |
|                                | 15.8    | * 58010 |
| **MD visit cost**              | 53.2    | * 57845 |
|                                | 83.2    | * 57906 |
| **NOAC monthly drug cost**     | 148.6   | * 57084 |
|                                | 399.5   | * 58527 |
| **Minor ischemic stroke**      | 10712   | * 57985 |
| upfront cost                   | 15000   | * 57672 |
| **Moderate ischemic stroke**   | 15009   | * 58112 |
| upfront cost                   | 19120   | * 57811 |
| **Severe ischemic stroke**     | 19442   | * 58123 |
| upfront cost                   | 32360   | * 57221 |
| **Minor ischemic stroke**      | 570     | * 58100 |
| monthly maintenance cost       | 729     | * 57695 |
| **Moderate ischemic stroke**   | 1247    | * 61260 |
| monthly maintenance cost       | 3463    | * 54535 |
| **Severe ischemic stroke**     | 2355    | * 13192 |
| monthly maintenance cost       |         | 60079   |
|                                | 7292    | * 55716 |
| **Nondisabling ICH upfront cost**| 16646   | * 57773 |
|                                | 37163   | * 58069 |

© 2022 Chen W et al. *JAMA Health Forum.*
| Condition                  | Baseline Cost | Non-Baseline Cost |
|---------------------------|---------------|-------------------|
| Disabling ICH             | 53526         | 56931             |
| Upfront Cost              |               |                   |
|                          | 116485        | 59317             |
| Minor bleed               | 113.7         | 57883             |
| Upfront Cost              |               |                   |
|                          | 162.1         | 57896             |
| Nondisabling ICH          | 1397          | 57684             |
| Monthly maintenance cost  |               |                   |
|                          | 2095          | 58103             |
| Disabling ICH             | 2502          | 57569             |
| Monthly maintenance cost  |               |                   |
|                          | 3752          | 58216             |
| Pulse palpation           | 0.31          | 57942             |
| Cost                      |               |                   |
|                          | 0.85          | 57884             |
| 12L ECG cost              | 32.0          | 57892             |
| RN visit cost             | 9.4           | 57838             |
|                          | 25.6          | 57900             |
| Major bleed               | 6703          | 57594             |
| Upfront Cost              |               |                   |
|                          | 45612         | 59865             |
| Patch monitor cost        | 199           | 58024             |
| OAC uptake rate           | 60            | 66393             |
|                          | 100           | 61450             |

* denotes baseline condition

ICER = incremental cost-effectiveness ratio; Freq = frequency; PP = pulse palpation; 12L = 12-lead electrocardiogram; PPG = wearable photoplethysmography; 1L = wearable single-lead electrocardiogram; PM = patch monitor; AF = atrial fibrillation; RR = relative risk; OAC = oral anticoagulant; NOAC = novel oral anticoagulant
eFigure. Cost-effectiveness Acceptability Curves

Depicted is the overall probability of greatest cost-effectiveness for specific strategies (y-axis) as a function of increasing willingness-to-pay (x-axis). Probabilities account for parameter uncertainty in probabilistic sensitivity analyses (see main text). Each colored line represents a specific screening strategy (see legend), and the highest line at a given point on the x-axis represents the strategy most likely to be cost-effective at that willingness-to-pay threshold. Strategies with probability of greatest cost-effectiveness <1% are not depicted.
eReferences.

1. Steinhubl SR, Waalen J, Edwards AM, et al. Effect of a Home-Based Wearable Continuous ECG Monitoring Patch on Detection of Undiagnosed Atrial Fibrillation: The mSToPS Randomized Clinical Trial. *JAMA*. 2018;320(2):146-155. doi:10.1001/jama.2018.8102

2. Halcox JPJ, Wareham K, Cardew A, et al. Assessment of Remote Heart Rhythm Sampling Using the AliveCor Heart Monitor to Screen for Atrial Fibrillation: The REHEARSE-AF Study. *Circulation*. 2017;136(19):1784-1794. doi:10.1161/CIRCULATIONAHA.117.030583

3. Fitzmaurice DA, Hobbs FDR, Jowett S, et al. Screening versus routine practice in detection of atrial fibrillation in patients aged 65 or over: cluster randomised controlled trial. *BMJ*. 2007;335(7616):383. doi:10.1136/bmj.39280.660567.55

4. Rooney MR, Soliman EZ, Lutsey PL, et al. Prevalence and Characteristics of Subclinical Atrial Fibrillation in a Community-Dwelling Elderly Population: The ARIC Study. *Circ Arrhythm Electrophysiol*. 2019;12(10):e007390. doi:10.1161/CIRCEP.119.007390

5. Turakhia MP, Ziegler PD, Schmitt SK, et al. Atrial Fibrillation Burden and Short-Term Risk of Stroke: Case-Crossover Analysis of Continuously Recorded Heart Rhythm From Cardiac Electronic Implanted Devices. *Circ Arrhythm Electrophysiol*. 2015;8(5):1040-1047. doi:10.1161/CIRCEP.114.003057

6. Go AS, Reynolds K, Yang J, et al. Association of Burden of Atrial Fibrillation With Risk of Ischemic Stroke in Adults With Paroxysmal Atrial Fibrillation: The KP-RHYTHM Study. *JAMA Cardiol*. 2018;3(7):601-608. doi:10.1001/jamacardio.2018.1176

7. Diederichsen SZ, Haugan KJ, Kronborg C, et al. A Comprehensive Evaluation of Rhythm Monitoring Strategies in Screening for Atrial Fibrillation: Insights from Patients at Risk Long-Term Monitored with Implantable Loop Recorder. *Circulation*. Published online March 2, 2020:CIRCULATIONAHA.119.044407. doi:10.1161/CIRCEP.119.044407

8. Caro JJ, Briggs AH, Siebert U, Kuntz KM, ISPOR-SMIDM Modeling Good Research Practices Task Force. Modeling good research practices--overview: a report of the ISPOR-SMIDM Modeling Good Research Practices Task Force-1. *Med Decis Mak Int J Soc Med Decis Mak*. 2012;32(5):667-677. doi:10.1177/0272989X12454577

9. Heeringa J, van der Kuip DAM, Hofman A, et al. Prevalence, incidence and lifetime risk of atrial fibrillation: the Rotterdam study. *Eur Heart J*. 2006;27(8):949-953. doi:10.1093/eurheartj/ehi825

10. Rothwell PM, Coull AJ, Giles MF, et al. Change in stroke incidence, mortality, case-fatality, severity, and risk factors in Oxfordshire, UK from 1981 to 2004 (Oxford
Vascular Study). *Lancet Lond Engl.* 2004;363(9425):1925-1933. doi:10.1016/S0140-6736(04)16405-2

11. Friberg L, Rosenqvist M, Lip GYH. Evaluation of risk stratification schemes for ischaemic stroke and bleeding in 182 678 patients with atrial fibrillation: the Swedish Atrial Fibrillation cohort study. *Eur Heart J.* 2012;33(12):1500-1510. doi:10.1093/eurheartj/ehr488

12. ASCEND Study Collaborative Group, Bowman L, Mafham M, et al. Effects of Aspirin for Primary Prevention in Persons with Diabetes Mellitus. *N Engl J Med.* 2018;379(16):1529-1539. doi:10.1056/NEJMoa1804988

13. Connolly SJ, Eikelboom J, Joyner C, et al. Apixaban in patients with atrial fibrillation. *N Engl J Med.* 2011;364(9):806-817. doi:10.1056/NEJMoa1007432

14. Granger CB, Alexander JH, McMurray JJV, et al. Apixaban versus warfarin in patients with atrial fibrillation. *N Engl J Med.* 2011;365(11):981-992. doi:10.1056/NEJMoa1107039

15. Giugliano RP, Ruff CT, Braunwald E, et al. Edoxaban versus warfarin in patients with atrial fibrillation. *N Engl J Med.* 2013;369(22):2093-2104. doi:10.1056/NEJMoa1310907

16. Connolly SJ, Ezekowitz MD, Yusuf S, et al. Dabigatran versus warfarin in patients with atrial fibrillation. *N Engl J Med.* 2009;361(12):1139-1151. doi:10.1056/NEJMoa0905561

17. Patel MR, Mahaffey KW, Garg J, et al. Rivaroxaban versus warfarin in nonvalvular atrial fibrillation. *N Engl J Med.* 2011;365(10):883-891. doi:10.1056/NEJMoa1009638

18. Matsumura-Nakano Y, Shizuta S, Komasa A, et al. Open-Label Randomized Trial Comparing Oral Anticoagulation With and Without Single Antiplatelet Therapy in Patients With Atrial Fibrillation and Stable Coronary Artery Disease Beyond 1 Year After Coronary Stent Implantation. *Circulation.* 2019;139(5):604-616. doi:10.1161/CIRCULATIONAHA.118.036768

19. Zheng SL, Roddick AJ. Association of Aspirin Use for Primary Prevention With Cardiovascular Events and Bleeding Events: A Systematic Review and Meta-analysis. *JAMA.* 2019;321(3):277-287. doi:10.1001/jama.2018.20578

20. Antithrombotic Trialists’ (ATT) Collaboration, Baigent C, Blackwell L, et al. Aspirin in the primary and secondary prevention of vascular disease: collaborative meta-analysis of individual participant data from randomised trials. *Lancet Lond Engl.* 2009;373(9678):1849-1860. doi:10.1016/S0140-6736(09)60503-1

21. Stroke Prevention in Atrial Fibrillation Study. Final results. *Circulation.* 1991;84(2):527-539.
22. Sanmuganathan PS, Ghahramani P, Jackson PR, Wallis EJ, Ramsay LE. Aspirin for primary prevention of coronary heart disease: safety and absolute benefit related to coronary risk derived from meta-analysis of randomised trials. *Heart Br Card Soc*. 2001;85(3):265-271. doi:10.1136/heart.85.3.265

23. Ridker PM, Cook NR, Lee IM, et al. A randomized trial of low-dose aspirin in the primary prevention of cardiovascular disease in women. *N Engl J Med*. 2005;352(13):1293-1304. doi:10.1056/NEJMoa050613

24. Mauri L, Kereiakes DJ, Yeh RW, et al. Twelve or 30 months of dual antiplatelet therapy after drug-eluting stents. *N Engl J Med*. 2014;371(23):2155-2166. doi:10.1056/NEJMoa1409312

25. Benjamin EJ, Muntner P, Alonso A, et al. Heart Disease and Stroke Statistics-2019 Update: A Report From the American Heart Association. *Circulation*. 2019;139(10):e56-e528. doi:10.1161/CIR.0000000000000659

26. Barker WH, Mullooly JP, Getchell W. Changing incidence and survival for heart failure in a well-defined older population, 1970-1974 and 1990-1994. *Circulation*. 2006;113(6):799-805. doi:10.1161/CIRCULATIONAHA.104.492033

27. McKee PA, Castelli WP, McNamara PM, Kannel WB. The natural history of congestive heart failure: the Framingham study. *N Engl J Med*. 1971;285(26):1441-1446. doi:10.1056/NEJM197112232852601

28. Dannenberg AL, Garrison RJ, Kannel WB. Incidence of hypertension in the Framingham Study. *Am J Public Health*. 1988;78(6):676-679. doi:10.2105/ajph.78.6.676

29. Bancks MP, Kershaw K, Carson AP, Gordon-Larsen P, Schreiner PJ, Carnethon MR. Association of Modifiable Risk Factors in Young Adulthood With Racial Disparity in Incident Type 2 Diabetes During Middle Adulthood. *JAMA*. 2017;318(24):2457-2465. doi:10.1001/jama.2017.19546

30. Atherosclerosis Risk in Communities Study. https://www2.cscc.unc.edu/aric/sites/default/files/public/manuals/Updates%20Manual3_20151112.pdf. Accessed July 27, 2020.

31. Cea-Soriano L, Fowkes FGR, Johansson S, Allum AM, García Rodriguez LA. Time trends in peripheral artery disease incidence, prevalence and secondary preventive therapy: a cohort study in The Health Improvement Network in the UK. *BMJ Open*. 2018;8(1):e018184. doi:10.1136/bmjopen-2017-018184

32. Briffa T, Nedkoff L, Peeters A, et al. Discordant age and sex-specific trends in the incidence of a first coronary heart disease event in Western Australia from 1996 to 2007. *Heart Br Card Soc*. 2011;97(5):400-404. doi:10.1136/hrt.2010.210138

© 2022 Chen W et al. *JAMA Health Forum*. 
33. Eagle KA, Rihal CS, Foster ED, Mickel MC, Gersh BJ. Long-term survival in patients with coronary artery disease: importance of peripheral vascular disease. The Coronary Artery Surgery Study (CASS) Investigators. *J Am Coll Cardiol.* 1994;23(5):1091-1095. doi:10.1016/0735-1097(94)90596-7

34. Inglis SC, Bebchuk J, Al-Suhaim SA, et al. Peripheral artery disease and outcomes after myocardial infarction: an individual-patient meta-analysis of 28,771 patients in CAPRICORN, EPEHESUS, OPTIMAAL and VALIANT. *Int J Cardiol.* 2013;168(2):1094-1101. doi:10.1016/j.ijcard.2012.11.033

35. Bonaca MP, Bhatt DL, Storey RF, et al. Ticagrelor for Prevention of Ischemic Events After Myocardial Infarction in Patients With Peripheral Artery Disease. *J Am Coll Cardiol.* 2016;67(23):2719-2728. doi:10.1016/j.jacc.2016.03.524

36. Attar R, Wester A, Koul S, Eggert S, Andell P. Peripheral artery disease and outcomes in patients with acute myocardial infarction. *Open Heart.* 2019;6(1):e001004. doi:10.1136/openhrt-2018-001004

37. Tunstall-Pedoe H, Peters SAE, Woodward M, Struthers AD, Belch JFF. Twenty-Year Predictors of Peripheral Arterial Disease Compared With Coronary Heart Disease in the Scottish Heart Health Extended Cohort (SHHEC). *J Am Heart Assoc.* 2017;6(9). doi:10.1161/JAHA.117.005967

38. Hiatt WR, Fowkes FGR, Heizer G, et al. Ticagrelor versus Clopidogrel in Symptomatic Peripheral Artery Disease. *N Engl J Med.* 2017;376(1):32-40. doi:10.1056/NEJMoa1611688

39. Burn J, Dennis M, Bamford J, Sandercock P, Wade D, Warlow C. Long-term risk of recurrent stroke after a first-ever stroke. The Oxfordshire Community Stroke Project. *Stroke.* 1994;25(2):333-337.

40. Yung D, Kapral MK, Asllani E, Fang J, Lee DS, Investigators of the Registry of the Canadian Stroke Network. Reinitiation of anticoagulation after warfarin-associated intracranial hemorrhage and mortality risk: the Best Practice for Reinitiating Anticoagulation Therapy After Intracranial Bleeding (BRAIN) study. *Can J Cardiol.* 2012;28(1):33-39. doi:10.1016/j.cjca.2011.10.002

41. Hylek EM, Go AS, Chang Y, et al. Effect of intensity of oral anticoagulation on stroke severity and mortality in atrial fibrillation. *N Engl J Med.* 2003;349(11):1019-1026. doi:10.1056/NEJMoa022913

42. Marini C, De Santis F, Sacco S, et al. Contribution of atrial fibrillation to incidence and outcome of ischemic stroke: results from a population-based study. *Stroke.* 2005;36(6):1115-1119. doi:10.1161/01.STR.0000166053.83476.4a

43. Anderson CS, Jamrozik KD, Broadhurst RJ, Stewart-Wynne EG. Predicting survival for 1 year among different subtypes of stroke. Results from the Perth Community Stroke Study. *Stroke.* 1994;25(10):1935-1944.
44. van Asch CJ, Luitse MJ, Rinkel GJ, van der Tweel I, Algra A, Klijn CJ. Incidence, case fatality, and functional outcome of intracerebral haemorrhage over time, according to age, sex, and ethnic origin: a systematic review and meta-analysis. *Lancet Neurol.* 2010;9(2):167-176. doi:10.1016/S1474-4422(09)70340-0

45. Rosand J, Eckman MH, Knudsen KA, Singer DE, Greenberg SM. The effect of warfarin and intensity of anticoagulation on outcome of intracerebral hemorrhage. *Arch Intern Med.* 2004;164(8):880-884. doi:10.1001/archinte.164.8.880

46. Hardie K, Hankey GJ, Jamrozik K, Broadhurst RJ, Anderson C. Ten-year survival after first-ever stroke in the perth community stroke study. *Stroke.* 2003;34(8):1842-1846. doi:10.1161/01.STR.0000082382.42061.EE

47. McNeil JJ, Wolfe R, Woods RL, et al. Effect of Aspirin on Cardiovascular Events and Bleeding in the Healthy Elderly. *N Engl J Med.* 2018;379(16):1509-1518. doi:10.1056/NEJMoa1805819

48. Landerfeld CS, Beyth RJ. Anticoagulant-related bleeding: clinical epidemiology, prediction, and prevention. *Am J Med.* 1993;95(3):315-328.

49. Yong JHE, Thavorn K, Hoch JS, et al. Potential Cost-Effectiveness of Ambulatory Cardiac Rhythm Monitoring After Cryptogenic Stroke. *Stroke.* 2016;47(9):2380-2385. doi:10.1161/STROKEAHA.115.011979

50. Neyt M, Van Brabandt H, Devos C. The cost-utility of catheter ablation of atrial fibrillation: a systematic review and critical appraisal of economic evaluations. *BMC Cardiovasc Disord.* 2013;13:78. doi:10.1186/1471-2261-13-78

51. Sullivan PW, Arant TW, Ellis SL, Ulrich H. The cost effectiveness of anticoagulation management services for patients with atrial fibrillation and at high risk of stroke in the US. *PharmacoEconomics.* 2006;24(10):1021-1033. doi:10.2165/00019053-200624100-00009

52. Gage BF, Cardinalli AB, Owens DK. The effect of stroke and stroke prophylaxis with aspirin or warfarin on quality of life. *Arch Intern Med.* 1996;156(16):1829-1836.

53. O’Brien CL, Gage BF. Costs and effectiveness of ximelagatran for stroke prophylaxis in chronic atrial fibrillation. *JAMA.* 2005;293(6):699-706. doi:10.1001/jama.293.6.699

54. Flaker GC, Belew K, Beckman K, et al. Asymptomatic atrial fibrillation: demographic features and prognostic information from the Atrial Fibrillation Follow-up Investigation of Rhythm Management (AFFIRM) study. *Am Heart J.* 2005;149(4):657-663. doi:10.1016/j.ahj.2004.06.032

55. Harrington Amanda R., Armstrong Edward P., Nolan Paul E., Malone Daniel C. Cost-effectiveness of Apixaban, Dabigatran, Rivaroxaban, and Warfarin for Stroke

© 2022 Chen W et al. *JAMA Health Forum.*
Prevention in Atrial Fibrillation. *Stroke*. 2013;44(6):1676-1681. doi:10.1161/STROKEAHA.111.000402

56. Centers for Medicare & Medicaid Services. https://www.cms.gov

57. Agency for Healthcare Research and Quality. https://hcupnet.ahrq.gov/#setup

58. Yong Jean Hai Ein, Thavorn Kednapa, Hoch Jeffrey S., et al. Potential Cost-effectiveness of Ambulatory Cardiac Rhythm Monitoring After Cryptogenic Stroke. *Stroke*. 2016;47(9):2380-2385. doi:10.1161/STROKEAHA.115.011979

59. Lowres N, Neubeck L, Salkeld G, et al. Feasibility and cost-effectiveness of stroke prevention through community screening for atrial fibrillation using iPhone ECG in pharmacies. *Thromb Haemost*. 2014;111(6):1167-1176. doi:10.1160/TH14-03-0231

60. Oguz M, Lanitis T, Li X, et al. Cost-effectiveness of Extended and One-Time Screening Versus No Screening for Non-Valvular Atrial Fibrillation in the USA. *Appl Health Econ Health Policy*. 2020;18(4):533-545. doi:10.1007/s40258-019-00542-y

61. Medical Expenditure Panel Survey (MEPS), Agency for Healthcare Research and Quality. https://meps.ahrq.gov/about_meps/Price_Index.shtml#t2a2

62. U.S. Bureau of Labor Statistics. https://data.bls.gov/cgi-bin/surveymost?bls