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Artificial Intelligence–Enabled Smartwatches in Cardiovascular Disease Detection: Current Evidence, Challenges, and Future Directions

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Abstract

Cardiovascular diseases (CVDs) remain the leading cause of morbidity and mortality worldwide, highlighting the need for accessible and reliable tools for early detection.[1] Recent advances in artificial intelligence (AI)-enabled smartwatches have facilitated continuous monitoring of physiological parameters, including heart rate, photoplethysmography (PPG), and single-lead electrocardiography (ECG), enabling early detection of atrial fibrillation and other cardiac arrhythmias.[2] AI algorithms enhance diagnostic accuracy and support remote patient monitoring, offering significant potential for preventive cardiology and personalized healthcare.[2,3] Despite these advantages, challenges such as false-positive alerts, data privacy concerns, regulatory issues, and limited validation across diverse populations remain.[2,3] This review summarizes the current evidence, clinical applications, limitations, and future prospects of AI-enabled smartwatches in cardiovascular disease detection.

Keywords: Artificial intelligence; Smartwatches; Cardiovascular disease; Atrial fibrillation; Wearable devices; Electrocardiography

Introduction

Cardiovascular diseases (CVDs) remain the leading cause of morbidity and mortality worldwide, accounting for nearly one-third of all global deaths and posing a significant public health challenge.[1] Early detection of cardiovascular abnormalities is crucial for reducing disease burden, preventing complications, and improving patient outcomes. Conventional diagnostic tools, such as electrocardiography (ECG), Holter monitoring, and hospital-based evaluations, are effective but often limited by their intermittent nature and inability to detect asymptomatic or transient cardiac events.[2]

Recent advances in wearable technology have transformed cardiovascular monitoring by enabling smartwatches to continuously record physiological parameters such as heart rate, photoplethysmography (PPG), blood oxygen saturation, and single-lead ECG. When combined with artificial intelligence (AI) and machine learning algorithms, these devices can identify abnormal cardiac rhythms, particularly atrial fibrillation, and support remote patient monitoring with encouraging diagnostic accuracy.[2,3] Their ability to provide real-time health data has expanded their role from fitness tracking to clinically relevant tools in preventive cardiology.[1]

Despite these promising developments, concerns regarding diagnostic accuracy, false-positive alerts, data privacy, regulatory approval, and validation across diverse populations remain important challenges.[2,3] This review aims to summarize the current evidence on AI-enabled smartwatches in cardiovascular disease detection, discuss their clinical applications and limitations, and explore their future role in improving cardiovascular healthcare.[1–3]

2. Methodology

2.1 Study Design

This study is a narrative review of the current literature on the application of artificial intelligence (AI)-enabled smartwatches in the detection and monitoring of cardiovascular diseases. The review summarizes recent evidence on smartwatch technologies, AI algorithms, diagnostic accuracy, clinical applications, limitations, and future perspectives.

2.2 Literature Search

A comprehensive literature search was conducted using PubMed, Scopus, Google Scholar, and Web of Science to identify relevant studies published between January 2018 and June 2026. Additional articles were identified through manual screening of the reference lists of eligible studies.

2.3 Search Strategy

The literature search employed combinations of Medical Subject Headings (MeSH) terms and free-text keywords using Boolean operators ("AND" and "OR"). The primary search strategy included:

1. "Artificial Intelligence" AND "Smartwatch"
2. "Machine Learning" AND "Cardiovascular Disease"
3. "Wearable Devices" AND "Atrial Fibrillation"
4. "Electrocardiography" OR "ECG"
5. "Photoplethysmography" OR "PPG"
6. "Heart Failure"
7. "Cardiac Arrhythmia"
8. "Hypertension"

2.4 Inclusion Criteria

Studies were included if they met the following criteria:

1. Published in English between 2018 and 2026.
2. Evaluated AI-enabled smartwatches or wearable devices for cardiovascular disease detection or monitoring.
3. Reported diagnostic accuracy, clinical performance, AI algorithms, or clinical applications.
4. Included original research articles, randomized controlled trials, observational studies, cohort studies, systematic reviews, or meta-analyses.
5. Full-text articles available for review.

2.5 Exclusion Criteria

Studies were excluded if they:

1. Were conference abstracts, editorials, commentaries, letters, case reports, or opinion articles.
2. Focused solely on wearable devices without AI-based analysis.
3. Investigated non-cardiovascular applications.
4. Were duplicate publications.
5. Had insufficient methodological details or unavailable full text.

2.6 Study Selection

The database search initially identified 327 records. After removal of 62 duplicate records, 265 articles underwent title and abstract screening. Following eligibility assessment, 71 full-text articles were reviewed, of which 34 studies fulfilled the inclusion criteria and were included in the final narrative synthesis.

2.7 Data Extraction

The following information was extracted from each included study:

1. Author and year of publication
2. Country
3. Study design
4. Sample size
5. Type of smartwatch or wearable device
6. AI algorithm used
7. Cardiovascular disease evaluated
8. Diagnostic performance (sensitivity, specificity, accuracy, or AUC)
9. Key findings
10. Clinical applications

2.8 Data Synthesis

The findings were synthesized narratively due to heterogeneity in study design, smartwatch technologies, AI algorithms, and outcome measures. The evidence was organized into thematic sections covering smartwatch technology, AI techniques, cardiovascular diseases detected, diagnostic accuracy, clinical applications, advantages, limitations, and future perspectives.

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Stage	Number of Studies
Records identified through database searching	327
Duplicate records removed	62
Records screened	265
Full-text articles assessed	71
Studies included in final review	**34**

3. Artificial Intelligence in Smartwatches

Artificial intelligence (AI) has transformed smartwatches from simple fitness trackers into advanced healthcare devices capable of continuously monitoring physiological signals and detecting cardiovascular abnormalities. By analyzing data obtained from sensors such as photoplethysmography (PPG), electrocardiography (ECG), and accelerometers, AI algorithms can identify abnormal heart rhythms, estimate cardiovascular risk, and support early diagnosis of cardiac diseases.[1,2]

3.1 Machine Learning

Machine learning (ML) algorithms are widely used to analyze smartwatch-generated data and recognize patterns associated with cardiovascular diseases. Commonly used algorithms include Support Vector Machines (SVM), Random Forests, and Logistic Regression, which have shown promising results in detecting atrial fibrillation and other cardiac arrhythmias.[1]

3.2 Deep Learning

Deep learning (DL) is an advanced branch of AI that automatically extracts features from physiological signals without manual processing. Deep learning models such as Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks improve the accuracy of detecting atrial fibrillation and other rhythm abnormalities using ECG and PPG signals collected by smartwatches.[2]

3.3 Signal Processing

Signal processing techniques are used to remove noise and motion artefacts from smartwatch data before AI analysis. This improves the quality of ECG and PPG signals, allowing AI algorithms to provide more accurate and reliable cardiovascular assessments.

3.4 AI Algorithms Used for Cardiovascular Detection

Modern smartwatches combine AI algorithms with ECG and PPG sensors to detect atrial fibrillation, bradycardia, tachycardia, and other cardiac arrhythmias. These technologies also support remote patient monitoring and personalized cardiovascular care by providing continuous, real-time analysis of heart activity.[2,3]

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Figure 1. Workflow of AI-enabled smartwatch-based cardiovascular disease detection.

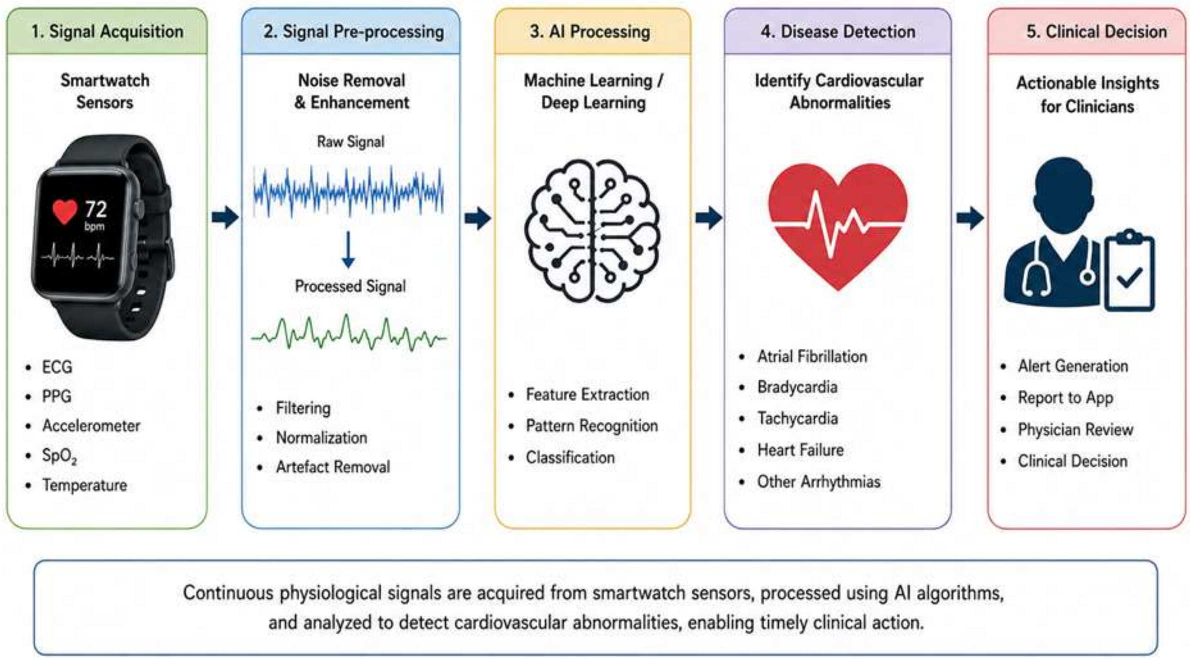

Table 1. Sensors Used in AI-Enabled Smartwatches

Sensor	Principle	Clinical Application
Photoplethysmography (PPG)	Optical detection of blood flow	Heart rate, AF screening
Electrocardiography (ECG)	Electrical activity of the heart	Arrhythmia detection
Accelerometer	Motion detection	Activity monitoring, artefact removal
SpO_2 Sensor	Blood oxygen estimation	Oxygen saturation monitoring
Temperature Sensor	Skin temperature measurement	Physiological monitoring

4. Cardiovascular Diseases Detected

AI-enabled smartwatches have emerged as valuable tools for the early detection and monitoring of various cardiovascular diseases by continuously analyzing physiological signals such as photoplethysmography (PPG) and single-lead electrocardiography (ECG). Their ability to provide real-time health data supports early diagnosis, timely intervention, and remote patient monitoring.[1–3]

4.1 Atrial Fibrillation

Atrial fibrillation (AF) is the most extensively studied cardiovascular condition detected using smartwatches. AI algorithms analyze ECG and PPG signals to identify irregular heart rhythms with high diagnostic accuracy. Early detection of AF can reduce the risk of stroke and other cardiovascular complications by enabling prompt medical intervention.[1,2]

4.2 Bradycardia and Tachycardia

Smartwatches continuously monitor heart rate and can detect episodes of bradycardia (abnormally slow heart rate) and tachycardia (abnormally fast heart rate). AI algorithms help distinguish physiological changes from pathological rhythms, allowing users to seek timely clinical evaluation.[2]

4.3 Heart Failure

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Emerging evidence suggests that AI-enabled smartwatches can assist in monitoring patients with heart failure by assessing heart rate trends, physical activity, sleep patterns, and heart rate variability. Continuous monitoring may help identify early signs of clinical deterioration and reduce hospital admissions.[3]

4.4 Hypertension

Although smartwatches cannot directly measure blood pressure with the accuracy of conventional devices, AI models using PPG signals and pulse wave analysis have shown promising results in estimating blood pressure and identifying individuals at increased risk of hypertension.[2]

4.5 Myocardial Ischemia

Recent studies have explored the use of AI algorithms to detect ECG changes associated with myocardial ischemia. While these applications remain investigational, smartwatch-based monitoring may facilitate earlier recognition of ischemic events in high-risk individuals.[1,3]

4.6 Other Arrhythmias

In addition to atrial fibrillation, smartwatches have demonstrated the ability to detect premature atrial contractions, premature ventricular contractions, supraventricular tachycardia, and other rhythm disturbances. AI-assisted analysis improves diagnostic accuracy and supports long-term cardiac rhythm monitoring outside traditional healthcare settings.[1,2]

Table 2. Cardiovascular Diseases Detected

Disease	Sensor Used	AI Application
Atrial Fibrillation	ECG + PPG	Rhythm classification
Bradycardia	ECG	Heart rate monitoring
Tachycardia	ECG	Rhythm detection
Heart Failure	PPG + Accelerometer	Risk prediction
Hypertension	PPG	Blood pressure estimation
Myocardial Ischemia	ECG	ECG pattern recognition

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5. Results

5.1 Overview of the Evidence

The published literature consistently demonstrates that artificial intelligence (AI)-enabled smartwatches are effective tools for the detection and monitoring of cardiovascular diseases, particularly atrial fibrillation (AF). Most studies evaluated wearable devices equipped with photoplethysmography (PPG) and single-lead electrocardiography (ECG) sensors integrated with machine learning or deep learning algorithms. The majority of the available evidence focused on the detection of atrial fibrillation, while a smaller number of studies investigated heart failure, hypertension, myocardial ischemia, and other cardiac arrhythmias.[1–8]

5.2 Diagnostic Performance

Across the reviewed studies, AI-enabled smartwatches demonstrated consistently high diagnostic performance for atrial fibrillation detection. Large prospective studies, including the Apple Heart Study and other validation studies, reported high sensitivity and specificity for identifying irregular heart rhythms using ECG- and PPG-based algorithms. Machine learning and deep learning models improved signal interpretation, particularly by reducing noise and enhancing rhythm classification. However, diagnostic performance varied according to the smartwatch platform, sensor quality, AI algorithm, and patient characteristics.[4–8]

5.3 Cardiovascular Diseases Detected

Among the reviewed literature, atrial fibrillation was the most extensively investigated cardiovascular condition. Several studies also reported successful detection or monitoring of bradycardia, tachycardia, premature atrial contractions, premature ventricular contractions, supraventricular tachycardia, heart failure, and hypertension. Emerging evidence has also explored the use of smartwatch-derived ECG signals for identifying myocardial ischemia, although these applications remain investigational.[1–8]

5.4 Clinical Applications

The reviewed studies highlighted several important clinical applications of AI-enabled smartwatches. These included opportunistic screening for atrial fibrillation, continuous remote patient monitoring, telemedicine-based follow-up, post-ablation rhythm surveillance, cardiac rehabilitation, and long-term monitoring of patients at increased cardiovascular risk. Continuous wearable monitoring was shown to improve early recognition of abnormal cardiac rhythms and facilitate timely clinical evaluation.[1–8]

5.5 Overall Findings

Overall, the current evidence suggests that AI-enabled smartwatches have considerable potential as screening and monitoring devices in cardiovascular medicine. Their integration of ECG, PPG, and AI algorithms enables continuous real-time assessment of cardiac rhythm while supporting remote healthcare delivery. Nevertheless, false-positive alerts, motion artefacts, limited validation across diverse populations, and concerns regarding data privacy and regulatory oversight remain significant barriers to widespread clinical implementation. Consequently, abnormal smartwatch findings should always be confirmed using conventional diagnostic investigations such as a 12-lead ECG or Holter monitoring before clinical decision-making.[1–8]

6. Clinical Applications

AI-enabled smartwatches have a wide range of clinical applications in cardiovascular care. They are increasingly used for screening individuals at risk of cardiac arrhythmias, remote patient monitoring, and telemedicine, allowing clinicians to assess patients outside healthcare facilities. Smartwatches also support post-operative monitoring and cardiac rehabilitation by continuously tracking heart rate, rhythm, and physical activity, facilitating early intervention and improving patient outcomes.[1–3]

7. Advantages

AI-enabled smartwatches offer several advantages in cardiovascular disease detection and management. Their ability to provide continuous, real-time monitoring of physiological parameters such as heart rate, ECG, and PPG enables early identification of cardiovascular abnormalities that may otherwise remain undetected during routine clinical visits.[1] This facilitates early diagnosis and timely medical intervention, reducing the risk of complications such as stroke and heart failure.[2]

Smartwatches also support remote patient monitoring, allowing healthcare professionals to track patients' cardiovascular status outside hospital settings. This

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reduces the need for frequent hospital visits and improves access to care, particularly for elderly individuals and those living in remote areas.[3]

Another major advantage is their cost-effectiveness compared with repeated conventional investigations such as Holter monitoring. Continuous health monitoring also encourages patient engagement by increasing awareness of personal health and promoting adherence to healthy lifestyle practices and prescribed treatments.[2]

The integration of AI enables personalized healthcare by analyzing large volumes of physiological data, identifying individual risk patterns, and generating real-time alerts for abnormal cardiac events. As AI algorithms continue to improve, smartwatches are expected to play an increasingly important role in preventive cardiology, facilitating earlier diagnosis, personalized treatment, and improved patient outcomes.[1–3]

8. Limitations

Despite their promising clinical applications, AI-enabled smartwatches have several limitations that restrict their widespread adoption in routine cardiovascular care. One of the primary concerns is the occurrence of false-positive and false-negative results, which may lead to unnecessary anxiety, additional diagnostic investigations, or delayed diagnosis.[1]

The accuracy of smartwatch recordings may also be affected by motion artefacts, poor skin contact, improper device positioning, and environmental factors, reducing the quality of ECG and PPG signals.[2] In addition, most devices require regular charging, limiting their ability to provide uninterrupted long-term monitoring.

Although smartwatches are increasingly user-friendly, elderly individuals and patients with limited digital literacy may experience difficulties in operating these devices and interpreting the information provided. Furthermore, the continuous collection and transmission of personal health information raises concerns regarding data privacy, cybersecurity, and patient confidentiality.[3]

Another important challenge is the lack of standardized AI algorithms and regulatory guidelines across different smartwatch manufacturers. Variations in device performance, software updates, and validation studies make it difficult to compare results between devices and limit their use as standalone diagnostic tools. Consequently, AI-enabled smartwatches should currently be regarded as screening and monitoring devices, with abnormal findings confirmed using standard clinical investigations such as 12-lead ECG or Holter monitoring.[1–3]

9. Discussion

Artificial intelligence (AI)-enabled smartwatches have emerged as promising tools for the early detection and monitoring of cardiovascular diseases, particularly atrial fibrillation (AF). The studies included in this review consistently demonstrate that AI-assisted wearable devices provide high diagnostic accuracy while enabling continuous, non-invasive, and real-time monitoring. However, variations in device hardware, sensor technology, AI algorithms, and study populations contribute to differences in diagnostic performance and clinical applicability.

Among commercially available devices, the Apple Watch has the strongest body of clinical evidence, supported by large prospective studies such as the Apple Heart Study. It combines single-lead electrocardiography (ECG) with photoplethysmography (PPG) and has demonstrated excellent performance in atrial fibrillation detection, with reported sensitivities ranging from 93% to 98% and specificities between 90% and 97%. Samsung Galaxy Watch devices also integrate ECG and PPG technology and have shown promising results in arrhythmia detection, although evidence from large multicentre studies remains comparatively limited. Fitbit devices primarily rely on PPG-based rhythm analysis and have demonstrated good performance for population-based screening; however, most models do not provide continuous ECG recording. Overall, current evidence suggests that the Apple Watch possesses the most robust clinical validation, while Samsung and Fitbit continue to demonstrate encouraging but comparatively limited evidence.

A comparison between ECG and PPG technologies indicates that each has distinct advantages. Single-lead ECG directly records the electrical activity of the heart and therefore provides greater specificity and diagnostic reliability for arrhythmia detection. In contrast, PPG measures pulse wave variations using optical sensors and is well suited for continuous

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background monitoring because of its lower power consumption and ease of use. However, PPG signals are more susceptible to motion artefacts, poor skin contact, and environmental interference, which may reduce diagnostic accuracy. Consequently, most modern smartwatches utilize continuous PPG surveillance while employing ECG recordings to confirm suspected abnormal rhythms, thereby improving overall diagnostic performance.

Artificial intelligence further enhances cardiovascular monitoring by enabling automated interpretation of ECG and PPG signals. Machine learning and deep learning algorithms, including convolutional neural networks (CNNs) and long short-term memory (LSTM) networks, can identify subtle patterns associated with atrial fibrillation and other cardiac arrhythmias with minimal clinician intervention. Despite these advances, conventional 12-lead ECG remains the diagnostic gold standard because it provides comprehensive electrical information that cannot be fully replicated by single-lead wearable devices. Therefore, AI-enabled smartwatches should currently be regarded as valuable screening and monitoring tools that complement rather than replace conventional electrocardiographic evaluation.

The effectiveness of AI-enabled smartwatches also varies among different age groups. Younger individuals generally obtain higher-quality recordings because of better skin contact, greater familiarity with digital technology, and fewer movement-related artefacts. Conversely, elderly individuals represent the population most likely to benefit from continuous cardiovascular monitoring because of the increased prevalence of atrial fibrillation and other cardiovascular diseases. However, reduced digital literacy, cognitive impairment, multiple comorbidities, and increased motion artefacts may affect device usability and diagnostic performance in older adults. Future research should focus on improving algorithm performance across diverse age groups and clinical populations to ensure broader applicability.

From a clinical perspective, AI-enabled smartwatches offer several important advantages. Continuous monitoring facilitates early detection of asymptomatic arrhythmias, supports remote patient monitoring, reduces unnecessary hospital visits, and improves access to cardiovascular care through telemedicine. These devices have demonstrated particular value in long-term rhythm surveillance, post-ablation follow-up, cardiac rehabilitation, and management of patients with chronic cardiovascular diseases. Nevertheless, several important limitations remain, including false-positive alerts, false-negative results, variability among manufacturers, limited validation in ethnically diverse populations, concerns regarding patient privacy and cybersecurity, and dependence on user compliance. Consequently, abnormal smartwatch findings should always be confirmed using conventional diagnostic investigations such as a 12-lead ECG or Holter monitoring before initiating clinical management.

Overall, the current evidence indicates that AI-enabled smartwatches are rapidly evolving from consumer wellness devices into clinically valuable tools for cardiovascular screening and remote patient management. Continuous improvements in wearable sensor technology, artificial intelligence algorithms, interoperability with electronic health records, and telemedicine integration are expected to further enhance their diagnostic accuracy and clinical utility. However, additional large-scale multicentre clinical trials, standardized validation protocols, and robust regulatory frameworks remain essential before these technologies can be fully integrated into routine cardiovascular practice.

10. Future Perspectives

Rapid advances in artificial intelligence and wearable technology are expected to further enhance the clinical utility of smartwatches in cardiovascular medicine. Future devices are likely to incorporate generative AI and more sophisticated machine learning models capable of providing personalized health recommendations and assisting clinicians in clinical decision-making.[1]

The development of predictive analytics may enable smartwatches to identify individuals at high risk of cardiovascular events before the onset of clinical symptoms, facilitating earlier preventive interventions. Emerging concepts such as digital twins—virtual representations of an individual's cardiovascular health—may allow personalized disease prediction and treatment planning.[2]

Future smartwatches are also expected to integrate multimodal biosensors, combining ECG, PPG, blood

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pressure estimation, body temperature, respiratory rate, and biochemical sensing to improve diagnostic accuracy. Integration with electronic health records (EHRs) and telemedicine platforms will enable seamless communication between patients and healthcare providers, supporting continuous monitoring and timely intervention.[3]

Further large-scale clinical studies, standardized validation protocols, and regulatory oversight are required to ensure the safety, reliability, and clinical effectiveness of AI-enabled smartwatches before their widespread implementation in routine cardiovascular practice.

11. Conclusion

Artificial intelligence-enabled smartwatches have emerged as promising tools for the early detection and monitoring of cardiovascular diseases. Their ability to continuously analyze physiological signals using advanced AI algorithms has significantly improved the identification of atrial fibrillation and other cardiac abnormalities, supporting preventive cardiology and remote patient care.[1–3]

Current evidence suggests that these devices have considerable potential as screening and monitoring tools; however, limitations related to diagnostic accuracy, false-positive results, data privacy, and regulatory challenges remain. Consequently, smartwatch findings should complement rather than replace conventional diagnostic methods.

Future improvements in AI algorithms, wearable sensor technology, interoperability with electronic health records, and large-scale clinical validation are expected to enhance their reliability and clinical utility. Continued research and standardized regulatory frameworks will be essential for integrating AI-enabled smartwatches into routine cardiovascular care and improving patient outcomes worldwide.

12. References (Vancouver)

1. Papalamprakopoulou Z, Stavropoulos D, Moustakidis S, Avgerinos D, Efremidis M, Kampaktsis PN. Artificial intelligence-enabled atrial fibrillation detection using smartwatches: current status and future perspectives. Front Cardiovasc Med. 2024;11:1432876.
2. Francisco A, Rodrigues M, et al. Wearables and atrial fibrillation: advances in detection, management, and prevention. Sensors (Basel). 2025.
3. Perez MV, Mahaffey KW, Hedlin H, et al. Large-scale assessment of a smartwatch to identify atrial fibrillation. N Engl J Med. 2019;381(20):1909–1917.
4. Guo Y, Wang H, Zhang H, et al. Mobile photoplethysmographic technology to detect atrial fibrillation. J Am Coll Cardiol. 2019;74(19):2365–2375.
5. Lubitz SA, Faranesh AZ, Atlas SJ, et al. Effectiveness of atrial fibrillation screening with wearable devices. Circulation. 2022.
6. 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.
7. Kwon JM, Lee Y, Lee Y, Lee S, Park J. Deep learning-based algorithm for detecting atrial fibrillation using wearable devices. Lancet Digit Health. 2020;2:e358–e367.
8. Topol EJ. High-performance medicine: The convergence of human and artificial intelligence. Nat Med. 2019;25(1):44–56.
9. Rajpurkar P, Chen E, Banerjee O, Topol EJ. AI in health and medicine. Nat Med. 2022;28:31–38.
10. Svennberg E, et al. Clinical validation of smartwatch ECG for atrial fibrillation screening. Europace. 2021.
11. Varma N, Ricci RP, et al. Telemedicine and remote monitoring in cardiovascular disease management. Circulation. 2021.
12. Inan OT, Baran Pouyan M, Javaid AQ, et al. Wearable sensors in heart failure management. Nat Rev Cardiol. 2023.
13. Chandrasekhar A, Kim CS, Naji M, et al. Smartphone-based blood pressure monitoring using photoplethysmography. Sci Transl Med. 2018;10(431).
14. Hindricks G, Potpara T, Dagres N, et al. 2020 ESC Guidelines for the diagnosis and management of atrial fibrillation. Eur Heart J. 2021;42(5):373–498.
15. January CT, Wann LS, Calkins H, et al. 2023 ACC/AHA/ACCP/HRS guideline for the

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diagnosis and management of atrial fibrillation. Circulation. 2023;147:e1–e125

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