انجمن آترواسکلروز ایران
Iranian Society of Atherosclerosis

ICCU 2025

International Congress on Cardiovascular Updates
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25th International Congress on Cardiovascular Updates

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Abstract Book

23 - 26 September 2025

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This 25th International Congress on Cardiovascular Updates

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Iranian Society of
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International Congress on **Cardiovascular** Updates

ICCU 2025

23 - 26 September 2025

Dear Colleagues and Guests,

It is our pleasure to extend you our very warm welcome on behalf of the Iranian Society of Atherosclerosis. We are grateful that you have accepted our invitation to attend the "25th International Congress on Cardiovascular Updates " in Tehran.

Year after year, this congress offers us the opportunity to renew contacts and hold discussions with delegates from all over the world on the pertinent issues of healthcare.

The speeches and events outlined in the congress agenda are arranged to cover a wide range of core topics in the fields of cardiovascular diseases.

We wish all our guests, whether from Iran or visiting from abroad, a productive and successful congress.

We also wish you a pleasant stay in Tehran. We thank all our sponsors, whose support made this significant gathering possible.

As we stand here surrounded by colleagues, humbled by what we've accomplished, yet inspired by hopes and dreams, hopes and dreams we wish to turn into reality. We hope to be able to offer better patient care and make advancements in the field.

Together we can draw strength from our bonds and learn from one another to expand our horizons.

We look forward to welcoming you in the 25th International Congress on Cardiovascular Updates (ICCU 2025).

Sincerely,

Massoud Ghasemi, MD.
President of Congress

Masoud Eslami, MD.
Secretary of Congress

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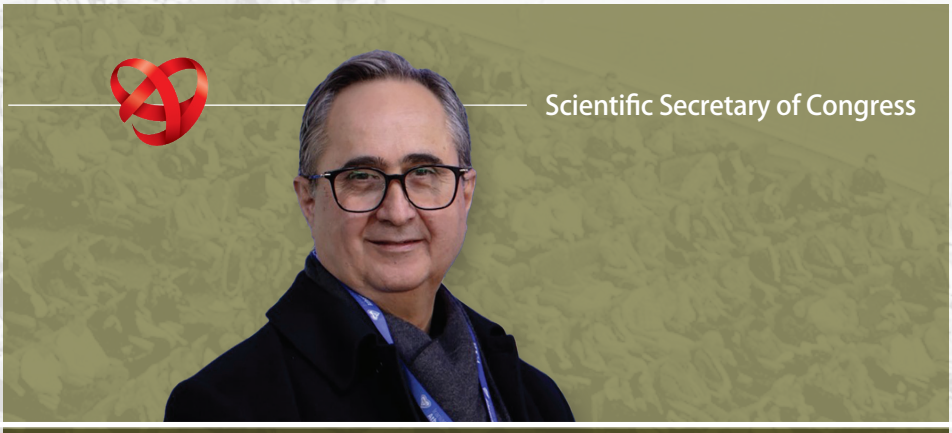
Iranian Society of **Atherosclerosis**

ICCU 2025

25th International Congress on Cardiovascular Updates

President of Congress

Massoud Ghasemi, MD



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Contents

Medical Articles

Nursing Articles

In Cardiogenic Shock, Overweight and Obesity Have the Lowest, Whereas Cachexia Has the Highest Mortality

Introduction:
The obesity paradox has been observed in patients with cardiovascular disease. The goal of this study was to evaluate whether obesity has a protective effect in patients presenting with cardiogenic shock

Material & Methods:
Method: Using a large Nationwide Inpatient (NIS) sample database, we evaluated mortality in patients with cardiogenic shock based on weight categories in adults.

Results:
A total of 843,020 patients over age 18 had a diagnosis of cardiogenic shock in the database. We found that overweight and obesity had the lowest mortality using univariate or multivariate analysis (overweight mortality of 20.66% vs. obesity mortality of 26.6% vs. 34.8% of normal weights). In contrast, cachexia was associated with the highest mortality in univariate analysis (cachexia 40.4%). Using multivariate analysis adjusting for age, baseline characteristics, and comorbidities, these relations remained unchanged (cachexia MVOR: 1.13; CI: 1.21–1.13; $p < 0.001$; overweight MVOR: 0.52, CI: 0.43–0.65; $p < 0.001$; obesity MVOR: 0.76, CI: 0.73–0.79; $p < 0.001$). After multivariate adjustment, morbid obesity had similar mortality to patients with normal weight (morbid obesity MVOR: 0.99 CI 0.95–01.03; $p = 0.6$)

Conclusion:
We observe a partial obesity paradox in patients with cardiogenic shock, showing that being overweight, followed by obesity, has the lowest mortality, whereas cachexia has the highest mortality despite multivariate adjustment.

Keywords:
cardiogenic shock; obesity; cachexia; CHF

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Strain Heterogeneity Mapping by Speckle-Tracking Echocardiography: A Novel Index for Predicting Ventricular Tachyarrhythmia Risk Beyond LVEF

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Introduction:
Ventricular tachycardia (VT) and ventricular fibrillation (VF) remain leading causes of sudden cardiac death in patients with structural heart disease. While global longitudinal strain (GLS) provides prognostic insight, conventional metrics often fail to capture the spatial mechanical heterogeneity that may underlie arrhythmogenic substrates. Speckle-tracking echocardiography with polar mapping enables precise quantification of segmental strain variations, potentially identifying high-risk “gray zones” where adjacent segments differ markedly in deformation. We hypothesized that integrating gray zone burden, apical involvement, and a novel Strain Heterogeneity Index (SHI) into a multivariate model could improve prediction of VT/VF events, guiding targeted implantable cardioverter-defibrillator (ICD) therapy beyond traditional LVEF-based selection.

Material & Methods:
Methods: We prospectively analyzed 82 patients with structural heart disease who underwent standard transthoracic echocardiography with speckle-tracking analysis. Longitudinal strain values for 17 LV segments were extracted from polar maps. Gray zones were defined as adjacent segments with an absolute strain difference >5%. The Strain Heterogeneity Index (SHI) was calculated as the standard deviation of all adjacent-segment differences, expressed as a percentage. Global longitudinal peak systolic strain (GLPS) and apical involvement (≥1 apical segment in a gray zone) were recorded. Patients were classified into VT/VF (ICD shock-confirmed) and non-VT/VF groups. Predictive performance of SHI, gray zone count, GLPS, and apical involvement was assessed using ROC analysis, and a multivariate logistic regression model was constructed. Calibration (Brier score) and clinical utility (decision curve analysis) were evaluated. Statistical significance was set at p value < 0.05.

Results:
In 82 patients (38 shock, 44 non-shock), the shock group showed higher Strain Heterogeneity Index (SHI) (7.2 ± 1.8% vs 4.1 ± 1.6%, p<0.001), more gray zones (>5% strain difference) (median 5 vs 2, p<0.001), greater apical involvement (68% vs 32%, p=0.002), and lower GLPS (−9.8% vs −12.4%, p<0.001). SHI >6.0% was the best single predictor of VT/VF (AUC 0.88), followed by ≥4 gray zones (AUC 0.83), GLPS <−10.5% (AUC 0.79), and apical involvement (AUC 0.74). A combined model (SHI, gray zones, GLPS, apical involvement) achieved AUC 0.93, good calibration (Brier score 0.237), and superior decision curve benefit, independent of LVEF.

Conclusion:
In this cohort of patients with structural heart disease, mechanical dispersion captured by strain heterogeneity mapping proved to be a powerful and independent marker of malignant ventricular arrhythmias. The Strain Heterogeneity Index (SHI), in synergy with gray zone burden, apical involvement, and GLPS, yielded a robust predictive model with AUC exceeding 0.90 and demonstrable net clinical benefit. These findings suggest that VT/VF vulnerability is not merely a function of global LV function, but of the spatial instability of myocardial contraction. Incorporating segmental strain heterogeneity into routine echocardiographic assessment may enable earlier identification of high-risk patients and refine selection for ICD therapy, potentially preventing sudden cardiac death in those overlooked by current guidelines.

Keywords:
SPECKLETRACKINGECHO, HERATFAILURE, VENTRICULARARRHYTHMIA

The Association Between Coronary Artery Ectasia and Red Cell Distribution Width

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Introduction:
Coronary artery ectasia (CAE) is an abnormal dilation of the coronary lumen, with a prevalence of 0.3-5% in patients undergoing angiography. Atherosclerosis is the main cause, while congenital anomalies, connective tissue and inflammatory diseases, infections, toxicity, and trauma also contribute. Markis et al. classified CAE into four types, from diffuse multi-vessel to localized ectasia. Red cell distribution width (RDW), routinely measured in complete blood counts, reflects variation in erythrocyte size and is mainly used in anemia evaluation. Recent studies show elevated RDW independently predicts adverse outcomes in cardiovascular disease, acute coronary syndrome, and heart failure. This study aimed to assess the relationship between CAE and RDW, which may clarify its role as a potential marker for early detection and improved management of CAE.

Methods:
This analytical cross-sectional study was conducted on patients who underwent coronary angiography at Afshar Yazd Hospital between March 2015 and July 2021. All angiography reports were reviewed, and cases of coronary artery ectasia (CAE) were identified and re-evaluated by an interventional cardiologist. Patients with liver or kidney dysfunction, heart failure, valvular disease, thyroid disorders, or coronary stenosis >30% were excluded. Those with anemia who had received transfusion or erythropoietin therapy were also excluded. Data on RDW levels and demographic characteristics—including age, sex, diabetes, hypertension, dyslipidemia, BUN, creatinine, mean corpuscular volume (MCV), white blood cell (WBC) count, and the type and extent of vessel involvement (LAD, LCX, RCA)—were collected from patient files and reports. Missing data was supplemented by contacting patients when needed. A control group of 370 individuals without CAD or CAE was also included, and their RDW and demographic data were obtained from medical records. Statistical analysis was performed using SPSS version 22. Continuous variables were expressed as mean ± SD, categorical variables as percentages, and comparisons between groups were made using the Chi-square test.

Results:
Among 19,421 patients undergoing angiography, 369 (1.9%) had CAE. The mean age was 57.4±12.2 years (27–85), and 61.5% were male. Mean hemoglobin was 14.5±4.4 g/dl, ejection fraction 50±7%, and RDW 13.7±0.7% (11–16.5%) in CAE patients versus 12.9±0.6% (8.3–17.5%) in controls. Comorbidities included diabetes in 24.1%, hypertension in 41.2%, hyperlipidemia in 28.5%, and smoking in 7.2%. No significant difference was found in RDW between CAE and controls (13.3±0.75 vs. 12.7±0.82, P=0.623). Similarly, RDW showed no significant variation based on vessel involvement, number of affected vessels, or CAE type according to the Markis classification.

Conclusion:
In this study of 19,421 angiography patients, the prevalence of coronary artery ectasia (CAE) was 1.9% (369 cases). RDW levels did not differ significantly between CAE patients and controls, nor across subgroups based on vessel involvement, number of vessels affected, or CAE type according to Markis classification. The most frequent pattern of ectasia involved all three major coronary vessels, with Type I being the predominant category. The finding suggest that RDW marker has not significantly related to CAE diagnosis. Further research is warranted to identify alternative biomarkers that may improve the prognostic assessment and management of patients with CAE.

Keywords:
Coronary Artery Ectasia, RDW, Biomarker

Assessment of the prevalence and associated risk factors of LQTS, with a focus on medication use, among patients with cardiovascular disease referred to Shahid Chamran Heart Hospital

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Background:
Given the importance of LQTS and its association with potentially fatal ventricular arrhythmias, assessing its prevalence across diverse populations is crucial.This study aims to determine the prevalence of LQTS and its associated risk factors, with a particular focus on medication use, among patients with cardiovascular disease admitted to a Heart Hospital in Iran.

Method:
Upon arrival at the emergency department, all patients were evaluated, and relevant data including medication use, past medical history and lab data were extracted from their medical records. Additionally, A 12-lead ECG was obtained from each patient at admission. In this study, the QT interval has been reported using both the Bazett and Hodges formulas. QTc thresholds were defined according to both the 2009 AHA/ACCF/HRS guideline and the 99th percentile reference values.

Result:
A total number of 371 individuals presented to the emergency department of Shahid Chamran Heart Hospital were included in this study. According to the 2009 guideline, 135 (36.4%) patients were diagnosed with LQTS based on the Bazett method, compared to 64 (17.25%) with the Hodges method. When considering the 99th percentile cutoff, 67 (18.05%) patients had QT intervals above the 99th percentile using the Bazett formula and 31 (8.35%) using the Hodges formula. Among the patients with LQTS, three experienced Torsades de Pointes (TdP) during hospitalization, and one patient succumbed to complications related to the syndrome. Of the 64 patients diagnosed according to the AHA/ACCF/HRS 2009 guideline, 27 (42.18%) were found to be using QT-prolonging medications. Furthermore, A significant correlation was observed between medication use and the incidence of LQTS.

Conclusion:
The prevalence of LQTS observed in the present study was slightly higher than in other studies, which may be attributed to the selection of a cardiac patient population. A significant correlation was observed between medication use and the incidence of LQTS. The significance of this finding is underscored by the fact that, in some cases, simply altering or discontinuing a medication can markedly reduce the risk of developing LQTS and its severe complications.

Keywords:
Cardiovascular disease, Long QT syndrome, Ventricular arrhythmias, Prevalence

Incidence of metabolic syndrome and its association with hs-CRP and RC levels in a large cohort study

Background:
Metabolic syndrome (MetS) is a group of related metabolic disorders, such as central obesity, dyslipidemia, hypertension, and hyperglycemia, which together increase the risk of cardiovascular disease, stroke, and type 2 diabetes. The impact of high-sensitivity C-reactive protein (hs-CRP) and remnant cholesterol (RC) on the development of metabolic syndrome is not well understood.Purpose: This study investigates the incidence of Mets and its relationship with high-sensitivity hs-CRP and RC levels among participants in a large cohort study.

Materials and Methods:
This study, initiated in 2007, conducted an extensive survey of the population using stratified cluster sampling. A total of 9,704 individuals aged 35 to 65 were recruited, with 7,560 completing the decade-long follow-up. This analysis focused on 4,691 participants without Mets at baseline. Demographic, anthropometric, biochemical, and clinical data were meticulously collected. Statistical analyses, including Cox regression, were performed using SPSS version 26 to assess the associations between hs-CRP, RC levels, and the development of Mets.

Results:
Over the decade, 1,599 participants (34.1%) developed Mets. Higher RC levels, particularly when combined with elevated hs-CRP, significantly increased the risk of Mets, with a more pronounced effect in females. Elevated hs-CRP alone did not significantly increase Mets risk(Table 1).Participants with higher RC and hs-CRP levels exhibited greater obesity, higher blood pressure, and adverse lipid profiles, indicating a higher risk of cardiovascular diseases. The shortest median survival times were observed in the RC ≥ 24 & hsCRP ≥ 3 group, with males generally having slightly longer survival times than females.(Table 2)

Conclusion:
Our findings highlight the critical role of RC and hs-CRP levels in predicting Mets and associated health outcomes. Monitoring these biomarkers is essential for early identification and management of at-risk individuals, especially females. Future research should focus on elucidating the underlying mechanisms and developing targeted interventions to mitigate the health risks associated with elevated RC and hs-CRP levels.

Keywords:
hsCRP, Remnant cholesterol, Metabolic syndromes

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Which feature of the metabolic syndrome is better predictor for coronary artery disease morbidity and mortality; a prospective 10-year analysis

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Introduction:
While numerous studies explored the connection between metabolic syndrome (MetS) components and coronary artery morbidity and mortality, none have specifically examined which component is most crucial. Therefore, this study intended to fill this gap in the research.

Purpose:
We seek to identify which aspect of metabolic syndrome most accurately predicts the morbidity and mortality associated with coronary artery disease (CAD).

Materials and Methods:
This prospective cohort study began in 2010 and was followed for 10 years. A total of 9704 subjects recruited in phase I (2007–2010) were followed, and after 10 years, 7560 participants continued with the study. Ultimately, 3748 subjects with metabolic syndrome (MetS) at baseline were selected. Metabolic syndrome is defined by international Diabetes Federation criteria In this study, 505 cases of MetS subjects developed CAD, with 81 cases resulting in death. CAD was confirmed by an expert cardiologist with using stress echocardiography, radioisotope scan, coronary angiography, coronary CT angiography, or exercise tolerance test for CAD We categorizes subjects with metabolic syndrome into ten groups based on whether they had 3, 4 and five components. The Cox regression model was used to assess the association between metabolic syndrome components and CAD, as well as death from CAD.

Results:
The results of this study showed that subjects with 3 components including waist circumference (WC), BP (Blood pressure), and FBG(Fasting blood glucose) (RR: 2.316) like subjects with 4 components including WC, FBG, BP, and TG (RR: 2.086), and 5 components including WC, FBG, BP, TG and high density lipoprotein(HDL) (RR: 2.194) have a risk of CAD. This finding suggested having high waist circumference, high blood pressure, and high fasting blood glucose are more important than lipid profile in developing CAD. The results revealed that having all components increased the risk of CAD mortality by three times (RR: 3.167). table 1, Figure1.

Conclusion:
Our result demonstrated that the WC, fasting blood glucose (FBG) and high blood pressure (BP), in addition to lipid disorders increase the risk of CAD and CAD mortality. It appears that controlling these factors can help prevent development of CAD over time.

Keywords:
Metabolic syndrome

Hydroalcoholic Extract of Pinus eldarica Mitigates Doxorubicin-Induced Cardiovascular Toxicity in Male Wistar Rats

Introduction:
Doxorubicin (DOX) is a chemotherapy agent known to cause cardiotoxicity, a serious adverse effect that may lead to heart failure. This study aimed to explore the potential cardioprotective effects of hydroalcoholic extract from the bark of Pinus eldarica against DOX-induced cardiac damage in rats.

Materials and Methods:
Male Wistar rats were randomly assigned to five groups: a control group, a DOX-induced cardiotoxicity group (single dose of 20 mg/kg intraperitoneally on day 10), and three treatment groups receiving DOX plus oral administration of P. eldarica bark extract at doses of 100, 200, and 400 mg/kg for 14 days. At the end of the experiment, body weight, cardiac electrical activity, serum markers of cardiac injury, oxidative stress parameters, and histopathological changes in heart tissue were evaluated.

Results:
DOX treatment caused a decrease in the R-R interval along with an increase in heart rate. It also elevated serum levels of creatine phosphokinase (CK-MB), lactate dehydrogenase (LDH), aspartate aminotransferase (AST), and malondialdehyde (MDA), coupled with significant myocardial cell damage. Administration of P. eldarica extract at 200 and 400 mg/kg significantly reversed these adverse effects.

Conclusion:
Pretreatment with Pinus eldarica bark extract effectively protected against DOX-induced structural and functional cardiac damage by reducing oxidative stress, myocardial injury markers, and improving cardiac electrical function in rats.

Keywords:
Doxorubicin, cardiotoxicity, Pinus eldarica.

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The impact of an Internet of Things-based health system in cardiac rehabilitation

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Introduction:
The advancement of new technologies as a digital health solution in continuous remote clinical monitoring in cardiovascular care has had a significant impact on the efficiency of cardiac rehabilitation in heart failure (HF) patients [1]. In this study, we evaluated the impact of an Internet of Things (IoT)-based patient monitoring system [2] on cardiac rehabilitation outcomes in a cohort of HF patients. Key applications of the Internet of Things include [3]: Monitoring devices that transmit status updates to healthcare professionals. Tracking the location of patients and medical equipment in hospitals. Managing medication orders. Monitoring terminally ill patients remotely.

Materials and Methods:
In this paper, we review articles from 2019 to 2024 considering the current explosion stage of Internet of Things. Articles were searched across eight databases: PubMed, Web of Science, EBSCO, Agricola, Scopus, IEEE Explore, Google Scholar and Cochrane. Permutation was performed using keywords such as *Heart failure, * rehabilitation, *IoT in combination with Boolean operators (AND and OR) and search strings. In this paper, we review articles from studies where IoT and AI have been directly applied in heart failure and HF patient rehabilitation. Studies where IoT has been used to assess the health status of HF patients and the impact of this technology on the patients' condition. The average number of patients in the reviewed articles ranged from fifteen to thirty patients. Key clinical characteristics of our study population are summarized in Tables 1 and 2. Table 1-- Baseline subjects' baseline Clinical Specification Clinical Parameters Patient Spec. Age (years) 51.0 (24–84) Men (%) 72.7% Arterial hypertension (%) 36.8% Coronary artery disease (%) 26.3% Atrial fibrillation (%) 11.5% Diabetes mellitus type 2 (%) 10.5% Implantable Cardioverter Defibrillator (%) 31.6% Chronic kidney disease 21.5%

Results:
After completing the standard care period, all patients were provided with an IoT-based system consisting of (i) a set of wirelessly connected medical devices such as the Beurer PO60 pulse oximeter; and the Omron M7 IntelliIoT blood pressure monitor; (ii) an advanced smartwatch and (iii) a new smartphone with a dedicated mobile patient application installed on it. A web-based platform designed for physician uses forms the patient-physician interface. Data derived from medical devices, including blood pressure and heart rate values, body weight, oxygen saturation, and body temperature, are wirelessly transmitted to the mobile app. To retrieve the physical activity level derived from the smartwatch, the system's mobile app was indirectly connected to the watch manufacturer's app via Google Fit. Table 2 includes Key clinical parameters at baseline and at end of follow-up. Parameter Baseline End of follow-up Mean LVEF (%) 43.0 ± 5.1 44.1 ± 5.8. Mean SBP (mmHg) 120.1 ± 14.4 119.2 ± 13.8

Conclusion:
IoT-based healthcare is a promising new approach in the rehabilitation of HF patients. Despite the study's clear limitations, including non-randomized design and small sample size, our results suggest that mobile application-based telerehabilitation constitutes a promising approach in HF patients' care, as it could aid them achieve a clinically relevant increase in physical activity. The impact of the system on patient physical activity levels, as well as physicians' timely commitment to care for enrolled patients, are key indicators of system performance. Primary role of IoT on the efficiency of cardiac rehabilitation in heart failure (HF) has been shown in Tables 1 and 2. Despite the impact of this system on patient health outcomes, larger randomized studies are needed to confirm our findings.

Keywords:
Internet of Things, Heart Failur

Evaluation of the prevalence of hypomagnesemia and the related risk factors in patients admitted to a referral heart hospital in Isfahan

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Background:
Magnesium is one of the most abundant cations in the body and plays a vital role in the function of the cardiovascular system. Hypomagnesemia can cause severe and dangerous cardiovascular complications. Also, since drugs that can lead to hypomagnesemia are commonly prescribed to cardiac patients, we decided to investigate the prevalence of hypomagnesemia in the population of cardiac patients to be aware of the prevalence of this condition as an important risk factor for cardiovascular events.

Material & Methods:
This study is a retrospective cross-sectional study of an analytical-observational type with a fundamental-applied approach, in which by recording the information of patients in pre-designed forms, the prevalence of hypomagnesemia in them and also the prevalence of hypomagnesemia Separation of different heart diseases and the relationship of hypomagnesemia with age, sex, GFR and drugs used have been evaluated.

Results:
A total of 982 patients were included in the study, of which 636 were men and 346 were women. The average age of the patients in this study was 63 years. Hypomagnesemia was observed in 138 patients (14%), and the prevalence of hypomagnesemia in patients with ventricular arrhythmias was 40%. It was also observed that only 47% of the patients with hypomagnesemia received magnesium, and the rest were not treated.

Conclusion:
This study highlights the importance of magnesium status and its relationship with various clinical factors in the studied population. This emphasizes the need to increase attention to hypomagnesemia, especially among vulnerable groups such as women and older adults.

Keywords:
Magnesium, Prevalence, Cardiovascular events

Acute Normovolemic Hemodilution Significantly Reduces RBC Transfusion and Lactic Acidosis Following Cardiac Surgery—A Propensity-Matched Study

Introduction:
Bleeding represents a major complication in heart surgeries. However, even small amounts of allogeneic blood are associated with reduced long-term survival and short-term complications. Acute normovolemic hemodilution (ANH) serves as a viable alternative, but its effectiveness and safety remain controversial.

Material & Methods:
This was a quasi-experimental study in a referral center on 2271 patients. We performed an extensive propensity-score matching to mitigate the lack of random assignment and potential selection bias. This resulted in 778 patients with no significant differences in 28 variables, including clinical, paraclinical, and operative features.

Results:
ANH significantly reduced the rate of RBC transfusion by 16% (50.9% vs. 60.9%; RR: 0.84; P = 0.006) and the number of transfused RBCs by 0.24 units (0.96 ± 1.32 vs. 1.20 ± 1.39; P = 0.013) but did not affect the transfusion of FFP or platelets. Furthermore, ANH significantly lowered the incidence of lactic acidosis by 53% (6.8 vs. 11.3%; RR: 0.47; P < 0.001) but had no notable impact on other short-term outcomes following heart surgery, including mortality, re-intubation, re-exploration, delayed sternal closure, length of ICU stay, or duration of mechanical ventilation.

Conclusion:
Mild-volume ANH significantly reduced the rate and amount of perioperative RBC transfusions, as well as the incidence of lactic acidosis following heart surgery. ANH did not affect the incidence of other complications during hospitalization. Implication: This suggests that ANH could be a safe and beneficial blood conservation technique. Further randomized clinical trials are needed to evaluate its effects.

Keywords:
Cardiacsurgery lactic acidosis normovolemichemodilution RBCtransfusion

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Deep Learning versus Traditional Machine Learning for Early Diagnosis of Atherosclerotic Cardiovascular Diseases: A Systematic review

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Introduction:
Early and accurate diagnosis of atherosclerotic cardiovascular diseases (ASCVD) is vital to improving patient outcomes and reducing global morbidity and mortality rates. While traditional machine learning (ML) algorithms such as support vector machines and random forests have demonstrated utility in analyzing clinical and imaging data for ASCVD risk prediction, deep learning (DL) models have recently emerged as powerful alternatives offering potential advancements in performance and automation.However, questions remain regarding their comparative effectiveness, interpretability, and impact on clinical outcomes.

Material & Methods:
A systematic review was conducted following the PRISMA checklist. We searched PubMed, Scopus, ScienceDirect, and Google Scholar for articles published between 2019-2025, using combinations of terms including “deep learning,” “machine learning,” “atherosclerosis,” “early diagnosis,” and “cardiovascular diseases.” Inclusion criteria comprised original studies directly comparing DL and ML in early ASCVD diagnosis, reporting on diagnostic performance metrics, interpretability, and clinical relevance. Data extraction and quality assessment adhered to the PRISMA guidelines.

Results:
Across 21 eligible studies, DL models especially convolutional neural networks (CNNs) and recurrent neural networks (RNNs) generally outperformed traditional ML algorithms in diagnostic accuracy (AUC 0.88–0.97 vs. 0.78–0.90, $p < 0.05$). DL excelled in complex image and multi-modal data integration, revealing subclinical atherosclerosis with greater sensitivity.

Notably, in imaging studies (e.g., coronary CT, carotid ultrasound), CNNs consistently detected plaque characteristics and early intimal changes more reliably than ML. However, interpretability remained a challenge for DL, with most studies highlighting ML methods as more transparent for feature attribution. Only 4 studies directly evaluated patient outcomes, showing DL-led early intervention correlated with modest improvements in event-free survival and risk reclassification. Limitations included small, single-center datasets, lack of standardized reporting, and minimal external validation across both approaches.

Conclusion:
Deep learning holds considerable promise in enhancing the early diagnosis of ASCVD, surpassing traditional ML in performance, especially for complex biomedical data. However, challenges persist in model explainability and real-world integration. Future multicenter studies with robust validation and explainable AI frameworks are warranted to translate these advances into tangible patient benefits.

Keywords:
Atherosclerosis DeepLearning MachineLearning EarlyDiagnosis CardiovascularDiseases

Unequal Pressure, Unequal Diagnosis: A Case of Takayasu Arteritis in a Young Female Athlete

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Introduction:
Takayasu arteritis (TAK) is a rare large-vessel vasculitis that affects young women, often with vague systemic symptoms such as fatigue or dizziness. Diagnostic delays are common, especially when classical signs are absent. Gender bias can further obscure cardiovascular diagnoses, particularly in young females misattributed to anxiety or stress.

Material & Methods:
A 25-year-old female bodybuilding instructor presented with progressive dizziness on exertion, fatigue, and left upper limb weakness. Over two months, she was repeatedly diagnosed with anxiety despite clinical findings including absent measurable BP in the left arm, a bruit over the subclavian area, and pulse asymmetry. Laboratory evaluation showed elevated ESR and CRP, and normocytic anemia. MRI angiography revealed aortic wall thickening with severe stenosis of the left subclavian and carotid arteries. She met 5 out of 6 ACR 1990 criteria for TAK and was classified as Numano Type V. Management included high-dose corticosteroids, methotrexate, and aspirin per AHA 2021 and ESC 2022 recommendations.

Results:
At 3-month follow-up, the patient showed significant clinical improvement. Fatigue and dizziness resolved, and strength returned to her left arm. Inflammatory markers normalized (ESR and CRP), and follow-up imaging showed stabilization of vascular lesions without new involvement.

Conclusion:
TAK should be considered in young females with unexplained constitutional symptoms and vascular asymmetry. Bilateral BP measurement, vascular examination, and awareness of gender-based diagnostic bias are key to reducing delays and improving outcomes in vasculitis cases.

Keywords:
Takayasu arteritis young gender asymmetry

Social Robots Benefits in Heart Failure for Cardiac Nurses

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Introduction:
Social robots [1] are AI-based agents with human-like characteristics that can facilitate remote monitoring of patients' psychological health and provide rehabilitation services. These robots could be effective in the management of heart failure. Benefits of social robots for nurses include Burden reduction: Social robots can perform some of the routine tasks associated with nursing care for a heart failure patient, Improved performance: By automating some tasks and providing remote monitoring, early warning system: The ability of social robots to more closely monitor vital signs and detect potential problems, and advanced communication: Social robots can facilitate communication between patients and nurses. This paper examines the perspectives of intensive care nurses in Tehran hospitals on the benefits of using a social robot (mentioned above) in the care of patients with heart failure.

Material & Methods:
In this paper, we review articles from 2016 to 2024 considering the current explosion stage of application of Social Robots in heart failure. Articles were searched across eight databases: PubMed, Web of Science, EBSCO, Agricola, Scopus, IEEE Explore, Google Scholar and Cochrane. Permutation was performed using keywords such as *Heart failure, * Social robots, *Artificial intelligence in combination with Boolean operators (AND and OR) and search strings. Moreover, the authors examined social robot benefits for cardiac nurses in heart failure patients care and designed a questionnaire based on themes mentioned. Questions asked centered on cardiac nurses' perspectives of social robot benefits within their respective hospitals. We gather their responses on our proposed topics of social robot benefits for cardiac nurses in heart failure patients care including burden reduction [3], improved performance [4], early warning systems, and advanced communications [5].

Results:
From 70 form distributed, the top five reported (n=65, 92/8%) benefit items were as follows: burden reduction (n=27, 41.5%); improved performance (n=14, 21.5%); early warning systems (n=21, 32.4%); and advanced communications (n=3, 4.6%).

Conclusion:
This research provides a snapshot of social robot benefits in nursing care for heart failure patients and can be used to direct future research efforts. Respondents reported that social robots research focusing on education, clinical practice, administration, and theory was limited. This research shows from point of view of Iranian nurses, social robots reduce nurse burden and provide nurses with the necessary alerts for real-time diagnosis and intervention through vital signs monitoring and rapid identification and automatic handling of some patient problems. Further research is needed to explain the challenges of social robot applications for nurses.

Keywords:
Social Robots, Heart Failure, Nursing

Effectiveness of the Green Heart Smartphone Application as a self-management intervention for hypertension and dyslipidemia: A randomized clinical trial

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Introduction:
Cardiovascular disease (CVD) is a major global health concern, the leading cause of death and disability. Thus, preventive interventions targeting modifiable risk factors are essential. Mobile-health technologies have emerged as promising tools for improving prevention by modifying risk factors. We created the "Green Heart" mobile app to help coronary artery disease (CAD) patients control their risk factors. The app has three modules: smoking cessation, dyslipidemia (DLP) control, and blood pressure (BP) management. This study evaluated the app's performance in monitoring hypertension (HTN) and DLP among known CAD cases.

Material & Methods:
A randomized controlled trial enrolled 1590 CAD subjects, including 1114 hypertensive patients and 1488 subjects with DLP, and assigned them randomly to paper-based education or application-based groups.

Results:
Regarding HTN, after 6 months, we finally analyzed 545 and 546 hypertensive patients, assigned to the conventional and app groups, respectively. Patients in the app group were more likely to have their BP managed successfully (88.6% vs. 78.5%; P<0.001). The app group showed higher odds of successful BP management (odds ratio [OR]: 2.13; 95% CI: 1.51 - 3.03). Regarding DLP, we analyzed 728 patients in the conventional and 714 patients in the app group. A higher percentage of patients in the app group (24.8%) had low-density lipoprotein cholesterol (LDL-C) levels less than 70 mg/dL (16.1%; P<0.001). The app group showed higher odds of reducing LDL-C (OR: 1.72; 95% CI: 1.32–2.26).

Conclusion:
We found that using the Green Heart app in the self-monitoring setting significantly improved BP and DLP management across the study population.

Keywords:
Dyslipidemia, Hypertension, Mobile-health, Prevention, Smartphone

Serum lipoprotein (a) and reclassification of coronary heart disease risk; application of prediction in a cross-sectional analysis of an ongoing Iranian cohort

Introduction:
Recent studies have introduced elevated lipoprotein(a) (Lp(a)) as a risk factor for coronary heart disease (CHD). This study investigated whether the addition of Lp(a) as a novel biomarker to the Framingham Risk Score (FRS) model improves CHD risk prediction.

Material & Methods:
The study included 1101 Iranian subjects (443 non-diabetic and 658 diabetic patients) who were followed for 10 years (2003–2013). Lp(a) levels and CHD events were recorded for each participant.

Results:
The Net Reclassification Index (NRI) after adding Lp(a) to the FRS model was 19.57% and the discrimination slope was improved (0.160 vs. 0.173). The Akaike Information Criterion (AIC), a measure of model complexity, decreased significantly after adding Lp(a) to the FRS model (691.9 vs. 685.4, P value: 0.007).

Conclusion:
The study concluded that adding Lp(a) to the FRS model improves CHD risk prediction in an Iranian population without making the model too complex. This could help clinicians to better identify individuals who are at risk of developing CHD and to implement appropriate preventive measures.

Keywords:
Lipoprotein(a), Integrated discrimination index

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The Role of Metabolic-Associated Steatotic Liver Disease (MASLD) and Subclinical Atherosclerosis in Cardiovascular Risk: A Review Based on Recent AHA/ESC Guidelines

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Background:
Metabolic dysfunction-associated steatotic liver disease (MASLD), the updated term for NAFLD, and subclinical atherosclerosis are two highly prevalent and silent conditions that independently increase the risk of atherosclerotic cardiovascular disease (ASCVD). Recent AHA and ESC guidelines have emphasized the importance of recognizing these conditions in the context of primary and secondary cardiovascular prevention.

Material & Methods:
Objective: To review current clinical and epidemiological evidence on the association between MASLD and coronary artery calcium (CAC) scoring with cardiovascular outcomes, and to evaluate AHA/ESC recommendations for screening and intervention, with special consideration of high-prevalence populations such as Iran.
Methods: A systematic review of large-scale cohort studies (n > 100,000), meta-analyses, and registries assessing the cardiovascular impact of MASLD and CAC in asymptomatic individuals. In addition, a focused analysis of updated AHA/ESC guidelines regarding cardiometabolic risk assessment, CAC-based screening, and therapeutic strategies—both pharmacologic and lifestyle-based.

Results:
• MASLD is associated with a 1.7–2.3-fold increased risk of coronary artery disease and heart failure, independent of traditional risk factors like obesity or diabetes. Advanced liver fibrosis further elevates risk. • Elevated rates of arrhythmia, stroke, and diastolic dysfunction have been observed in patients with MASLD. • Among adults ≤45 years, >10% may show a positive CAC score even in the absence of classical risk factors. CAC ≥100 AU or percentile >75 is now considered a decisive factor for initiating statin therapy. • Emerging tools such as polygenic risk scores and artificial intelligence algorithms show promise in predicting early subclinical atherosclerosis but require further validation. • Lifestyle interventions (weight loss, exercise, glycemic control) and cardiometabolic medications (e.g., GLP-1 receptor agonists, SGLT-2 inhibitors) are recommended in high-risk individuals.

Conclusion:
Conclusion: MASLD and subclinical atherosclerosis represent modifiable and complementary risk enhancers for ASCVD. In high-prevalence countries like Iran, integrating CAC screening in high-risk young adults and routine hepatic assessment in asymptomatic individuals may enable earlier detection and targeted prevention. MASLD should be incorporated as an additional risk factor in cardiovascular prediction models.

Keywords:
MASLD CAC SubclinicalAtherosclerosis CardiovascularRisk

Making Advances in Biomechanical Model Development of Atherosclerotic Arteries: A Review of Finite Element and Computational Fluid Dynamics Based Analyses

Introduction:
Cardiovascular disease in its turn is predicted by atherosclerosis, which occurs when plaques appear in the arteries. The biomechanical processes that come into play with respect to plaque formation and progression are valuable to understand in order to enhance the diagnosis treatment process. The newer computational techniques, especially the finite element analysis and computational fluid dynamics, offer potentially powerful tools by which to assess the stress, strain and other hemodynamic parameters within atherosclerotic arteries. In this review, current developments of biomechanical modeling atherosclerotic vessels are outlined with particular emphasis on mechanical and fluid-based models. It also explains the existing issues and trends in this blistering industry. The use of biomechanics, computer modeling and their application in clinical practice has immense potential when it comes to the prediction of plaque vulnerability and disease progression.

Material & Methods:
The systematic review was done by the use of thorough database searches on PubMed, Scopus, Web of Science, and IEEE Xplore, in the time frame of 2010 to 2024. Terms used in searching were biomechanical modeling, atherosclerotic arteries, finite element analysis, hemodynamic simulation, wall shear stress and plaque vulnerability combined in different manners. They included the language (only English), the peer-reviewed publications, and studies on direct topic related to the computational modeling of atherosclerotic vessels. Based on preliminary screening procedures, 156 studies were to be analyzed in their full text. The data filtering and categorization took place according to the method of modeling, types of vessels under analysis, parameters of the biomechanical analysis and clinical outcome. There was the evaluation of study quality based on the PRISMA guidelines. Descriptive statistics of quantitative parameters and thematic analysis of qualitative results were used to compile statistical results. Research was also divided down by computing method and validation methods and strength of clinical correlation.

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Results:
Analysis of reviews manifested that the most common method of modeling was finite element analysis (FEA) at 68 percent of studies and flanked with wall shear stress predictions of 84 percent hemodynamic studies. Multi-scale modeling has been used in about 23 percent of investigations. The most important biomechanical measures were shown to be arterial wall elastic modulus (2.1 0.8 Mpa), intima-media thickness (0.6 0.2 mm), and blood flow velocity (0.3 0.1 m/s). An uncoupled stress wall shear (<1 Pa) and large pressure gradients always exhibited escalated sensitivity of plaques. Investigations were devoted to coronary vessels (45%) carotid arteries (32%) and other arterial segments (23%). In 34 percent of the cases, fluid structure interaction model was used, whereas in 58 percent of the cases, patient specific geometries were utilized. Computational models predicted 78 percent accuracy at the plaque vulnerable parameters as compared to histological verification.

Conclusion:
Recent advances in biomechanical modeling of atherosclerotic arteries—particularly through CFD and finite element integration—have improved understanding of disease mechanisms. However, challenges remain, including inconsistent tissue property data, complex plaque progression modeling, and computational limitations. Validation against experimental data is still limited. AI and machine learning offer promise for optimizing models and predicting disease outcomes. Key achievements include use of patient-specific data and real-time imaging. Multi-physics models integrating hemodynamics, mass transport, and inflammation are expanding. Future efforts should focus on standardizing material properties, enhancing validation methods, and creating clinically applicable computational tools for personalized diagnosis and treatment planning.

Keywords:
biomechanical, atherosclerosis, hemodynamics

Genetic Underpinning of Atrial Standstill Syndrome in the Young: A Case Report of SCN5A R219C Mutation and Implications for Personalized Cardiovascular Medicine

Introduction:
Atrial standstill syndrome is a relatively rare form of atrial arrhythmia characterized by the complete absence of atrial electrical and mechanical activity. It is often associated with inherited sodium channelopathies, particularly mutations in the SCN5A gene, and may coexist with structural abnormalities such as atrial or ventricular fibrosis.

Materials and Methods:
We report a 22-year-old male presenting with palpitations and recurrent episodes of syncope. ECG revealed absent P waves and ventricular escape rhythm as well as occasionally bigeminal premature ventricular contractions. Cardiac MRI identified diffuse fibrosis in the right atrial and biventricular myocardium. Genetic testing uncovered a heterozygous SCN5A mutation (c.655T>C; p.R219C). Therefore, a cardiac resynchronization therapy device with a defibrillator (CRT-D) was implanted for the patient.

Results:
This case illustrates the footprints of SCN5A mutations in the structural myocardial fibrosis and atrial standstill syndrome. Early recognition and genetic diagnosis in young patients with unexplained bradyarrhythmias are critical for appropriate management and prevention of sudden cardiac death.

Keywords:
Atrial standstill syndrome - SCN5A

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Multi-Modal Artificial Intelligence Approaches Integrating Imaging and Clinical Data for Early Atherosclerosis Detection

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Introduction:
Atherosclerosis remains the principal precursor of cardiovascular morbidity and mortality worldwide, with early detection being critical for effective intervention. Recent advances in artificial intelligence (AI), particularly multi modal AI integrating both imaging and clinical data, promise transformative improvements in early atherosclerosis diagnosis by leveraging synergistic data sources. Systematic analysis of these emerging approaches is necessary to clarify their clinical utility, limitations, and research gaps.

Material & Methods:
This systematic review was conducted according to PRISMA guidelines. PubMed, Scopus, ISI Web of Science, and ISC databases were searched (2018–2024) using MESH terms: “Atherosclerosis”, “Artificial Intelligence”, “Medical Imaging”, “Electronic Health Records”, and “Machine Learning”. Inclusion criteria comprised original studies and systematic reviews applying multi-modal AI for early atherosclerosis detection, integrating imaging modalities (CT, MRI, ultrasound) and clinical/laboratory data. Risk of bias was assessed with the QUADAS-2 tool. Data extraction and synthesis were performed independently by two reviewers

Results:
A total of 42 studies were included, encompassing 18,900 participants across diverse cohorts. Deep learning architectures particularly convolutional neural networks (CNNs) and transformer-based models were most frequently employed for imaging feature extraction, while machine learning techniques (e.g., random forests, support vector machines) integrated clinical and laboratory parameters. Multi-modal frameworks consistently outperformed unimodal approaches, with reported area under the ROC curve (AUC) ranging from 0.84 to 0.96 for early atherosclerosis identification.Key benefits included enhanced sensitivity in subclinical atherosclerosis, improved risk stratification, and increased diagnostic reproducibility. However, heterogeneity in data sources, lack of prospective validation, interpretability challenges, and variable performance across populations were notable limitations. Few studies reported transparent model calibration, and external validation was frequently absent.

Conclusion:
Multi modal AI approaches integrating imaging and clinical data markedly enhance early atherosclerosis detection accuracy and risk stratification. Nonetheless, standardization in data integration, robust external validation, and real world clinical implementation remain imperative for translation to routine practice. Future research should prioritize interpretability, generalizability, and ethical integration.

Keywords:
Atherosclerosis ArtificialIntelligence DiagnosticImaging MachineLearning EarlyDiagnosis

Effects of Liraglutide, a GLP-1 agonist, on TIMI Frame count of patients with ST-segment elevation myocardial infarction undergoing primary percutaneous coronary intervention

Introduction:
Acute ST-Elevation MI is one of the leading causes of mortality and morbidity worldwide. Primary PCI is now the most effective treatment. Both no-perfusion and reperfusion cause endothelial cell damage no reflow or slow flow phenomenon. The main causes of reperfusion injury are oxidative stress, calcium overload leading to coronary microvascular spasm, energy depletion and Inflammation. GLP-1 Agonists, Glucagon-like- peptides, a sub group of incretins, are basically an anti-diabetic drug with major role in glycemic control, anti-oxidative and anti-inflammatory effect which seems to have a protective effect endothelial dysfunction.

Materials and Methods:
The target group of the study was 55 patients who referred to Imam Khomeini Hospital Complex with STEMI. Antegrade flow of the culprit vessel was scored based on the TIMI Frame Count system. TIMI Frame Count was evaluated by an interventional cardiologist, blind to the two groups. Echocardiography was done by a cardiologist, fellowship of echocardiography blind to two groups during the hospitalization of the patients. Patients in the liraglutide group received 1.8 mg of liraglutide, 30 minutes before the puncture, subcutaneously in the lateral area of the left arm.

Results:
In this study, 30 patients were included in the study based on the inclusion and exclusion criteria. Finally, 5 patients in the liraglutide group were excluded from the analysis due to the lack of stent placement (1 NECA patient, 2 emergency CABG patients, 1 coronary spasm patient, and 1 POBA patient). Based on the parametric tests, no significant difference was observed between the two groups, although a trend was seen towards the beneficial effect of liraglutide in TIMIFC and EF. But considering the small sample size, it seems to be more logical to use non-parametric tests, which according to this test; significant results were obtained in protecting against no-reflow.

Conclusion:
In general, both our study and the review of previous studies, the trend is towards the beneficial and even significant effects of liraglutide in improving reperfusion injury. But for more definitive results, more studies with larger sample size will definitely be needed.

Keywords:
STEMI Liraglutide PPCI noreflow TIMI

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GLP-1RA AND GLP-1/GIP THERAPIES IN HEART FAILURE: A META-ANALYSIS OF SAFETY, CARDIOVASCULAR AND RENAL OUTCOMES

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Introduction:
Heart failure (HF) is a global health challenge, affecting 64.3 million people and projected to increase 46% by 2030, with a $69.8 billion healthcare burden. It accounts for over 45% of cardiovascular deaths in the U.S., with 5-year mortality of 66% in HFrEF and 64% in HFpEF. Despite established therapies (MRAs, SGLT2 inhibitors, sacubitril-valsartan), substantial residual risk persists, driving the search for novel agents. GLP-1 receptor agonists, recommended for type 2 diabetes with atherosclerotic disease, and newer dual GLP-1/GIP agonists have emerged as candidates for HF treatment. Proposed benefits include improved endothelial function, reduced myocardial fibrosis via anti-inflammatory effects, enhanced natriuresis and vasodilation, and metabolic modulation. Yet, clinical evidence is mixed, with inconsistent findings across HF phenotypes and diabetes status, leaving their role in HF management uncertain.

Material & Methods:
We searched four databases for randomized controlled trials (RCTs) comparing GLP-1Ras monotherapy and GLP-1/GIP combination therapy to placebo in individuals with HF, conducting subgroup analyses based on diabetes status and HF subtype (reduced ejection fraction (HFrEF) and preserved ejection fraction (HFpEF)). We assessed efficacy outcomes including major adverse cardiovascular events (MACE), all-cause mortality, cardiovascular mortality, myocardial infarction (MI), stroke, hospitalization for HF, and safety outcomes including serious adverse events, nausea, vomiting, diarrhea, hypoglycemia, pancreatitis, renal-related adverse events, and discontinuation related to adverse events. Incidence rate ratios (IRRs) with 95% confidence intervals (CIs) were calculated.

Results:
Our analysis of 15 RCTs (15,332 participants; with mean age of 64.38 and male% of 61.73) found that GLP-1RAs significantly reduced the risk of MACE (IRR=0.75, 0.57; 0.99). Subgroup analyses revealed significant reductions in cardiovascular mortality among non-diabetic population (IRR=0.76, 95% CI 0.59;0.98), and in both MI (IRR=0.69, 95% CI 0.51;0.93), and hospitalization for HF (IRR=0.55, 95% CI 0.43;0.70) for the HFpEF subgroup. Regarding safety, the case group had a significantly higher risk of nausea, vomiting, diarrhea, and treatment discontinuation due to adverse events.

Conclusion:
Our findings support using GLP-1RAs and GIP to lower MACE risk in patients with HF, with particular benefits for those with HFpEF and without diabetes. Although effective, clinicians should remain mindful of the potential for gastrointestinal side effects with these agents.

Keywords:
heartfailure, GLP1RA, GIPDUALAGONIST, HFPEF

Percutaneous revascularization and medical therapy in patients with ischemic ventricular dysfunction: a systematic review study

Introduction:
Whether revascularization by percutaneous coronary intervention (PCI) can improve event-free survival and left ventricular function in patients with severe ischemic left ventricular systolic dysfunction, as compared with optimal medical therapy (i.e., individually adjusted pharmacologic and device therapy for heart failure) alone, is unknown. This systematic review study was done to compare percutaneous revascularization and medical therapy in patients with ischemic ventricular dysfunction.

Materials and Methods:
In this systematic review study, the search for studies in the ISI web of science, PubMed, Embase, CINAHL databases from July 2010 to July 2022 was done. The words including "ischemic ventricular dysfunction, percutaneous revascularization, Medical Therapy" were used. Eleven articles entered the study with acceptable points.

Results:
53728 patients participated in these studies. 32130 patients underwent percutaneous revascularization and 21643 patients underwent medical therapy. The mean age in the percutaneous revascularization group was 65.88 years and in the medical therapy group were 66.10. 23340 patients (72.6 %) of the percutaneous revascularization group and 15518 (71.6 %) of the medical therapy group were men. 1882 deaths were reported in the percutaneous revascularization group (5.8 %) and 2236 deaths (10.3 %) in the medical therapy group. Also, 2451 cases of myocardial infarction (7.6 %) were reported in the percutaneous revascularization group and 2677 (12.3 %) myocardial infarction in the medical therapy group. For Stroke, 2473 (7.7 %) cases were reported in the percutaneous revascularization group and 3523 (16.3 %) in the medical therapy group.

Conclusion:
The results of this study showed that the revascularization by PCI result in a lower incidence of death from any cause or myocardial infarction and stroke.

Keywords:
revascularization, medical therapy, cardiomyopathy

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Evaluation of Left Atrial Strain Parameters as Indicators of Coronary Artery Stenosis Severity in Patients Without Regional Wall Motion Abnormalities: A Cross-Sectional Study

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Introduction:
Left atrial (LA) strain parameters are important for evaluating cardiac function, especially in patients with coronary artery disease (CAD). This study aimed to evaluate and compare LA strain parameters with coronary artery stenosis in patients without regional wall motion abnormalities using echocardiography.

Materials and Methods:
This cross-sectional study included patients suspected of having CAD, who were candidates for angiography and required echocardiographic assessment, conducted from April 2024 to September 2024. Eligible patients who did not meet the exclusion criteria were enrolled after informed consent. Demographic data, including age, gender, comorbidities, cardiovascular risk factors, and medication use, were collected. All participants underwent two-dimensional echocardiography. LA strain assessment was performed for those meeting inclusion criteria. Coronary artery stenosis was evaluated using the Gensini score, which is based on the degree of coronary artery stenosis, vessel type, and stenosis location. A Gensini score of ≤16 was categorized as mild CAD, 17-42 as moderate CAD, and >42 as severe CAD. Control participants had no coronary artery stenosis. The study analyzed various echocardiographic parameters, including E, A, Deceleration time, E/A ratio, Ea, Aa, Ea/Aa ratio, E/Ea ratio, LA volume index, LA anteroposterior diameter, and LAEF.

Results:
A total of 1,00 patients were enrolled, including 32 controls and 68 cases with varying degrees of CAD. The case group showed significantly lower LA strain parameters, including LASr, LAScd, and LASct, compared to the control group ($p < 0.001$). The Gensini score was significantly higher in the case group, indicating more severe CAD ($p < 0.001$). LA stiffness was significantly higher in the case group compared to controls ($p < 0.001$). Significant differences in echocardiographic indices, such as E/A ratio and Ea/Aa ratio, were observed across CAD severity groups.

Conclusion:
LA strain parameters, particularly LASr, LAScd, and LA stiffness, were significantly associated with the severity of coronary artery stenosis. These parameters can be used as potential markers for assessing CAD severity, especially in patients without regional wall motion abnormalities, offering valuable diagnostic and prognostic insights.

Keywords:
Left atrial strain; CAD

Effects of high-intensity interval training on improving arterial stiffness symptoms in Iranian female students: A clinical trial

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Introduction:
Overweight and obesity are the most important risk factors for cardiovascular diseases. High-intensity interval training (HIIT) has a favorable effect on cardiovascular fitness in obese individuals, but little is known about arterial stiffness (AS) in female university students with overweight to obese body mass index (BMI) (25-30). Therefore, this study aimed to investigate the effects of HIIT on body composition, heart rate (HR), blood pressure (BP), blood lipid metabolism, as well as new AS propensity parameters (heart rate-arterial velocity index [AVI], arterial pressure volume index [API]) in overweight and obese female university students.

Materials and Methods:
Forty-four female university students with BMI (25-30) were randomly divided into two groups; control (n=22) and HIIT group in 3 9-min sessions at 90% of maximum heart rate [HRmax], with 1 min rest, 5 days per week, (n=22). Tests were performed before and after 4 weeks of training. ANOVA with repeated measures and simple effect analysis were used to analyze changes in the dependent variable.

Results:
After 4 weeks, HIIT training statistically significantly improved body composition by reducing body mass index, body fat percentage, total body fat mass (BFM), left arm BFM, left arm circumference, and degree of obesity, and increasing total body skeletal muscle mass, protein content, total body water, lean mass, body cell mass, and body composition. HIIT also significantly reduced heart rate and blood pressure. Regarding lipid profile, HIIT significantly improved blood lipid metabolism by reducing levels of; total cholesterol (TC), triglycerides, low-density lipoprotein, and TC/HDL, and increasing levels of high-density lipoprotein (HDL). In addition, AVI and API were significantly reduced by the HIIT intervention.

Conclusion:
HIIT provided significant and meaningful benefits for reducing body composition, improving heart rate, regulating blood pressure, and increasing blood lipid metabolism. It also reduced the incidence of AS symptoms in overweight and obese female university students. As a result, HIIT training effectively reduces the risk of atherosclerosis and protects obese female students from atherosclerosis by improving their cardiovascular function.

Keywords:
Arterial stiffness, Body composition, HIIT

Lipid disorder and Inflammation in coronary artery disease: clinical implications on Concordance/ discordance of RC, LDL and hsCRP

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Background:
Lipid disorders, especially those involving high cholesterol and low-density lipoprotein cholesterol (LDL-C), are major risk factors for coronary artery disease (CAD). Recently, remnant cholesterol (RC) and high-sensitivity C-reactive protein (hs-CRP) have also been identified as CAD risk factors. Research has suggested a combined effect of hs-CRP and RC, as well as LDL and RC, in the development of CAD. This study aims to explore the combined impact of hsCRP-RC and LDL-RC on the risk of CAD mortality and morbidity in a large cohort study. Purpose: The purpose of this study is to investigate the combined impact of hsCRP-RC and LDL-RC on the risk of developing CAD mortality and morbidity among participants in a large cohort study.

Material & Methods:
In a large cohort study, 9,704 individuals aged 35 to 65 were enrolled, with 7,560 completing a decade-long follow-up. Detailed demographic, anthropometric, biochemical, and clinical data were collected. CAD was confirmed after referring suspected cases to a cardiologist. In total, 757 cases were diagnosed using stress echocardiography, radioisotope scans, coronary angiography, coronary CT angiography, or exercise tolerance tests. Statistical analyses were conducted using SPSS version 26 to evaluate the predictive role of LDL-C, RC, and hs-CRP in predicting cardiovascular disease and its mortality. The Classic Cox regression model was utilized to identify the association between RC, LDL, hs-CRP, and CAD. Data were also adjusted for confounding factors like age, education, occupation, marital status, smoking, physical activity, and energy intake.

Results:
Our study found that having both RC ≥24 mg/dl and LDL-C ≥130 mg/dl, compared to just one of these factors, is a strong predictor of CAD morbidity ($p < 0.001$) but not mortality in this group. Additionally, RC ≥24 mg/dl combined with hsCRP ≥3 mg/l are stronger predictors of CAD morbidity and mortality than RC ≥24 mg/dl combined with LDL-C ≥130 mg/dl. The shortest median survival times were observed in individuals with RC ≥24 mg/dl and hsCRP ≥3 mg/l.figure 1,2

Conclusion:
Our study found that while lipid disorders are significant in the development of CAD, inflammation has a synergistic effect, particularly on CAD mortality. Controlling inflammation along with lipid disorders appears to reduce the incidence and mortality of CAD.

Keywords:
LDL HS-CRP RC

The Effect of Probiotic Supplementation on Trimethylamine-N-oxide Levels and Cardiovascular Outcomes: A Mini Systematic Review

Introduction:
Trimethylamine-N-oxide (TMAO), a gut microbiota–derived metabolite, has emerged as an independent risk factor for atherosclerosis, heart failure, and adverse cardiovascular outcomes. Elevated TMAO levels are associated with enhanced inflammation, endothelial dysfunction, and prothrombotic states. Modulating gut microbiota through probiotic supplementation has been proposed as a novel therapeutic strategy to reduce TMAO and improve cardiovascular health. Several randomized controlled trials (RCTs) have examined the effects of specific probiotic strains on TMAO concentrations and related cardiovascular markers. However, evidence remains limited and inconsistent, particularly in populations with established cardiovascular disease. This mini systematic review aims to synthesize current RCT evidence on the impact of probiotic interventions on circulating TMAO levels and cardiovascular outcomes in patients with cardiovascular disease.

Methods:
Due to time and resource constraints, we conducted a mini systematic review. We searched the PubMed database up to June 2025 using a search strategy that included keywords related to probiotics, trimethylamine-N-oxide (TMAO), and cardiovascular diseases. Only randomized controlled trials (RCTs) investigating probiotic interventions in patients with cardiovascular diseases were included. Studies focusing on other populations, such as patients with renal disease, were excluded. Data extracted from eligible studies included the type of probiotic, dosage, duration of intervention, type of cardiovascular disease, the effect of the intervention on TMAO levels, and clinical outcomes related to cardiovascular disease. Extracted data were qualitatively analyzed.

Results:
A total of 3 randomized controlled trials involving cardiovascular disease patients met the inclusion criteria and were qualitatively analyzed. The studies varied in probiotic strains, treatment durations (3 to 6 months), and patient populations (coronary artery disease, post-myocardial infarction, and heart failure). Two trials demonstrated significant reductions in serum TMAO levels following probiotic supplementation, accompanied by improvements in

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inflammatory markers and clinical symptoms in coronary artery disease and post-myocardial infarction patients. However, the third study in heart failure patients reported no significant changes in TMAO, inflammatory biomarkers, or cardiac function after probiotic or antibiotic treatment. These discrepancies may be related to differences in probiotic species, treatment length, and disease severity.

Conclusion:
Current evidence from randomized controlled trials suggests that probiotic supplementation may reduce serum TMAO levels and improve inflammatory and clinical outcomes in patients with cardiovascular disease. However, differences in probiotic types, doses, and treatment duration, along with mixed results—especially in heart failure patients—show that more large and well-designed studies are needed to confirm these effects and find the best treatment approach. Early results from people with cardiovascular risk factors also suggest that probiotics like lactofermented Annurca apple puree can improve TMAO and cholesterol levels, indicating probiotics might help in preventing heart disease. Overall, probiotics show promise for heart health, but further research is important.

Keywords:
Trimethylamine-N-oxide, Cardiovascular diseases, Probiotic, Gut microbiota

Isolated Cardiac Sarcoidosis: A Systematic Review

Introduction:
Isolated Cardiac Sarcoidosis (ICS) is a rare form of sarcoidosis confined to the heart, without involvement of other organs. While cardiac sarcoidosis can lead to severe complications such as arrhythmias and heart failure, ICS remains understudied, and no systematic review has previously addressed it.

Material & Methods:
A systematic review of literature from 1978 to 2025 identified 16 relevant studies, primarily case series.

Results:
ICS affects both sexes equally, with most patients aged 55–65. Compared to multi-organ cardiac sarcoidosis, ICS is associated with lower left ventricular ejection fraction and poorer survival. Variability in diagnostic criteria and potential selection bias were key limitations.

Conclusion:
ICS is a distinct and severe clinical entity with limited available data. Its poorer prognosis underscores the need for specific diagnostic and management guidelines. Future multicenter studies are essential to improve understanding and care for patients with ICS.

Keywords:
Isolated Cardiac Sarcoidosis, Prognosis, Diagnosis

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A review on biomimetic platelet membrane coated Nanoparticles for atherosclerosis therapy

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Introduction:
Atherosclerosis results from plaque buildup that blocks blood flow. Although drug delivery has been improved by nanomedicine, challenges such as immune clearance and poor targeting limit nanoparticle application. Platelet membrane coated nanoparticles (PNPs) have attracted attention for their ability to evade the immune system, circulate longer, and naturally target plaques. These features make PNPs ideal for delivering targeted therapies that also promote tissue repair and reduce inflammation. Remarkably, CE120 as a platelet membrane is advancing toward clinical use for cardiovascular treatment.

Material & Methods:
The study conducted a comprehensive search in PubMed, Scopus, ScienceDirect, and Google Scholar for articles from January 2020 to March 2025 using keywords like platelet membrane coated biomimetic nanoparticles, drug delivery, and atherosclerosis. Only English, peer-reviewed original research articles were included, whereas reviews, studies with an impact factor below 3, conference abstracts, and unrelated works were excluded. Seventeen articles were selected with data extracted on nanoparticle core types, platelet membrane sources and preparation, coating methods, payloads, experimental models, particle size, zeta potential, and plaque accumulation. Safety data and functional outcomes such as macrophage targeting and anti-inflammatory effects were recorded.

Results:
One-third of studies preferred vesicle-based cores, confirming their rising popularity compared to polymeric or inorganic systems. Human and mouse platelets were employed at nearly equal frequency as the source. Most groups applied extrusion or sonication for coating, with various cargos. Characterization confirmed platelet markers such as CD41, CD42b, CD61, and CD62P. Coating increased particle size and adjusted zeta potential. Particles targeted macrophages, reduced inflammation, scavenged ROS, enhanced cholesterol efflux, supported efferocytosis. Safety information consistently demonstrated more than 80% cell viability, absence of bleeding or thrombosis, and normal organ histology, which further supports their biocompatibility.

Conclusion:
Platelet-biomimetic nanoparticles show promise as anti-atherosclerotic agents by targeting macrophages, reducing inflammation, and promoting cholesterol efflux and efferocytosis, leading to plaque reduction and stabilization. They demonstrate superior plaque retention and safety, though hemocompatibility needs further study. With CE120 already advancing toward trials, platelet-mimetic nanomedicine is moving closer to becoming a practical therapy for cardiovascular disease.

Keywords:
Platelet nanoparticles atherosclerosis drug-delivery nanomedicine

Predictors of Prolonged Intensive Care Unit Stays After Isolated Simultaneous Aortic and Mitral Valve Replacement

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Purpose:
We aimed to identify predictors of prolonged intensive care unit (ICU) stays, including preoperative, intraoperative, and postoperative factors, in patients who underwent isolated simultaneous aortic valve replacement (AVR) and mitral valve replacement (MVR).

Methods:
This retrospective study included 395 consecutive patients who underwent isolated simultaneous AVR and MVR between 2006 and 2020. The preoperative, intraoperative, and first 72-hour ICU period variables were considered. In addition to univariate logistic binary regression, multivariable logistic binary regression was applied at three stages: preoperative, ICU admission, and the end of the first 72-hour ICU stay. A restricted cubic spline (RCS) with three knots at the 25th, 50th, and 75th percentiles was employed to determine the turning points of age, serum creatinine, cardiopulmonary bypass time, and ventilation time, which changed their effect on Ln (length of ICU stay).

Results:
Multivariable analysis was performed within a reasonable timeframe that would enable clinicians to identify determinants of the length of ICU stay at appropriate stages, including before surgery, upon ICU admission, and during the ICU stay. Age and creatinine as preoperative variables were independently correlated with the natural logarithm of the length of ICU stay [Ln (length of ICU stay)]. At the ICU admission stage, age and creatinine, cardiopulmonary bypass time, intraoperative blood product transfusion, and intra-aortic balloon pump insertion were independently correlated with Ln (length of ICU stay). During the ICU stay, ventilation time, occurrence of atrial fibrillation, positive inotropic agent usage, and all the variables mentioned above, except for intra-aortic balloon pump insertion, were independently correlated with Ln (length of ICU stay). The restricted cubic spline curve revealed that the Ln (length of ICU stay) significantly increased if age was more than 55 years, the serum creatinine level was more than 0.9 mg/dl, cardiopulmonary bypass time was more than 150 minutes, and ventilation time was more than 12 hours.

Conclusion:
Age, creatinine, cardiopulmonary bypass time, intraoperative blood product transfusion, intra-aortic balloon pump insertion, ventilation time, occurrence of atrial fibrillation, and positive inotropic agent usage were independent determinants for the length of ICU stay at various proposed stages in patients undergoing simultaneous AVR and MVR.

Keywords:
Intensive care unit, Mitral valve replacement, Aortic valve replacement, Cardiac surgery

Evaluation of Intra-Observer and Inter-Observer Variability of Left Atrial Conduction Time

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Background:
Atrial conduction time (ACT) is a marker for evaluating atrial electromechanical integrity in various conditions, such as atrial cardiomyopathy. We aimed to assess the intra- and interobserver variability of ACT measurements while considering reproducibility, repeatability, reliability, and precision.

Method:
One observer applied pulsed-wave tissue Doppler at the septal and lateral mitral annuli for 113 patients, and the obtained images were stored. Subsequently, seven experienced observers independently measured the interval from the beginning of the P wave in surface electrocardiography to the peak of a′ (ACT), across three consecutive cardiac cycles at the septal and lateral mitral annuli twice, with a two-month interval between measurements. Results: In the intra-observer study, the repeatability coefficient ranged between 8 msec and 30 msec, the minimal detectable change varied from 8 msec to 27 msec, absolute biases spanned from 0 msec to 6 msec, and the intraclass coefficient ranged from 0.735 to 0.979. The overall repeatability coefficient was 17 msec. In the interobserver study, the intraclass coefficient ranged from 0.707 to 0.794. The overall reproducibility coefficient was between 22 msec and 24 msec, the 95% upper limits of agreement with the mean ranged from 20 msec to 21 msec, and the minimal detectable change was 14 msec.

Conclusion:
In our study of intra- and interobserver variability of ACT, the agreement was good. The biases were small with a narrow level of agreement. Additionally, we calculated the overall reproducibility, repeatability, and minimal detectable change.

Keywords:
Atrial conduction time, Tissue Doppler echocardiography, Reproducibility, Repeatability, Reliability, Minimal detectable change

Assessing the Frequency and Factors Associated with Readmission in Myocardial Infarction Patients Under Follow-Up Nursing Care

Background and Aim:
Cardiovascular diseases, especially Myocardial Infarction (MI), are a major cause of hospital readmissions. This study aimed to investigate the frequency and related factors of readmission in MI patients who received follow-up nursing care.

Materials and Methods:
This descriptive-analytical cross-sectional study was conducted on 1782 MI patients. Data were collected through a census method from the follow-up nurse registry of Semnan University of Medical Sciences in 2024. The collected information included demographic characteristics, readmission status after discharge, and patients' knowledge and performance. Data were analyzed using descriptive statistics.

Results:
The 30-day readmission rate in the study population was reported to be very low, at 0.45% (8 patients). The main reason for readmission was the recurrence of disease symptoms. Additionally, only 0.51% of these patients had an unplanned emergency department visit within one month after discharge. The satisfaction level with the nursing follow-up services was reported to be 96.7%. In terms of knowledge and performance, patients had high awareness regarding medication names, danger signs, and administration times (over 90%). However, their knowledge was low regarding diet (66.7%), physical activity (73%), and the use of TNG pearls (54.4%).

Conclusion:
The results of this study indicate that the nursing follow-up care program is highly effective in reducing MI patient readmissions and is associated with high satisfaction levels. However, to maximize the program's effectiveness, it is essential to strengthen education in lifestyle-related areas such as diet and physical activity.

Keywords:
Myocardial Infarction, Readmission, Follow-up Nursing

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Risk Factors of Cardiovascular Diseases in Southwest Iran: Findings from Hoveyzeh Cohort Study

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Introduction:
Prevalence of cardiovascular diseases (CVDs) is dramatically high at the global level. Understanding the local contributing factors can be helpful for managing the problem. The modifiable risk factors of CVDs include unhealthy lifestyles, insulin resistance, hypertension (HTN), and hyperlipidemia. The aim of this this cross-sectional study was to evaluate the prevalence of CVDs and their risk factors among adults in Southwest Iran.

Materials and Methods:
The present cross-sectional study was conducted on 9828 adults 35-70 years. The demographic data, lifestyle habits, anthropometric data, and clinical and biochemical parameters were collected from the baseline data of the Hoveyzeh Cohort Study. The odds ratio (OR) of CVDs was assessed by logistic regression.

Results:
CVDs' prevalence was higher in females (16.2 vs. 12.6, $p \leq 0.001$). CVDs' prevalence was related to age, gender, marital status, lifestyle, anthropometric measurements, cholesterol, high-density lipoprotein, HTN, and fasting plasma glucose (FPG) ($p \leq 0.05$). The participants aged 65-70 y showed the highest odds of CVDs (OR: 3.97, 95% CI: (3.14, 5.01), ($p \leq 0.001$)). Males (OR: 1.76, 95% CI: (1.51, 2.05), $p \leq 0.001$), married status (OR: 1.63, 95% CI: (1.08, 2.47), $p = 0.021$), more using a mobile phone (OR: 1.26, 95% CI: (1.09, 1.46), $p \leq 0.002$), and smoking cigarettes (OR: 1.44, 95% CI: (1.24, 1.68), $p \leq 0.001$) associated with CVDs. Higher odds of CVDs were related to low physical activity (PA) (OR: 1.56, 95% CI: (1.34, 1.8), $p \leq 0.001$), body mass index > 30 (OR: 1.68, 95% CI: (1.01, 2.8), $p \leq 0.047$). Moreover, odds of CVDs were related to systolic blood pressure (SBP) ≥ 140 mm Hg (OR: 1.25, $p = 0.017$), FPG = 100-126 mg/dl (OR: 1.24, $p = 0.003$), and FPG > 126 mg/dl (OR: 1.71, $p \leq 0.001$).

Conclusion:
According to findings of this study the main risk factors of CVDs were older age, married status, using a mobile phone, low PA, smoking, obesity, and abnormal FPG and SBP.

Keywords:
Anthropometry, CVDs, hypertension; lipid profiles.

The Effect of Psychological Interventions on Modifying Preventive Behaviors and Enhancing Self-Care in Individuals at Risk of Cardiovascular Diseases: A Systematic Review

Introduction:
Cardiovascular diseases (CVDs) remain a leading cause of morbidity and mortality worldwide, with preventive behaviors and effective self-care playing critical roles in reducing risk. Psychological interventions, including cognitive-behavioral therapy, motivational interviewing, and stress management, aim to modify behaviors and enhance patients' engagement in preventive health practices. These interventions target factors such as health beliefs, motivation, and emotional regulation, which influence lifestyle choices like diet, exercise, and medication adherence. Despite numerous individual studies, the overall effectiveness of psychological interventions on preventive behaviors and self-care among individuals at risk of CVDs has yet to be comprehensively synthesized. This systematic review seeks to evaluate and integrate existing evidence on this topic to inform future clinical practice and research.

Materials and Methods:
This systematic review was conducted by searching electronic databases including PubMed, Scopus, Cochrane Library CENTRAL, CINAHL, SID, Magiran, and Google Scholar for gray literature. The search covered publications up to 2025 using keywords such as "psychological interventions," "preventive behaviors," "self-care," "cardiovascular disease risk," and their Persian equivalents. Inclusion criteria comprised randomized controlled trials, quasi-experimental, and observational studies investigating the effects of psychological interventions on preventive behaviors and self-care in individuals at risk of cardiovascular diseases. Studies without psychological intervention focus or lacking full-text availability were excluded. Two independent reviewers screened articles and extracted data. Quality assessment was performed using the Quality Assessment Tool for Studies with Diverse Designs (QATSDD). The review was conducted in accordance with PRISMA guidelines.

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Results:
From 390 studies identified, 40 duplicates were removed, leaving 38 for full-text review; 4 met the inclusion criteria (2 RCTs, 2 quasi-experimental). Psychological interventions improved preventive behaviors and self-care in individuals at risk of cardiovascular disease, enhancing medication adherence, physical activity, diet, and stress management. Delivered face-to-face or via telehealth, these interventions were effective despite variability in type and outcomes. Further large-scale, long-term trials are recommended.

Conclusion:
Psychological interventions are effective in improving preventive behaviors and self-care among individuals at risk of cardiovascular diseases. Incorporating such interventions into routine care can enhance cardiovascular health outcomes. Further large-scale, rigorous studies with extended follow-up are needed to strengthen the evidence base and guide clinical practice.

Keywords:
psychological interventions preventive behaviors self-care

Heart Disease in the Smart Era: A Review Novel Technologies in Predicting Heart Diseases

Introduction:
Cardiovascular diseases are one of the leading causes of death worldwide, and their late diagnosis can have serious clinical and economic consequences. In recent years, advancements in the field of Artificial Intelligence (AI) have opened up a new horizon for the early diagnosis of these diseases. By using machine learning and deep learning models, it is now possible to more accurately analyze complex medical data such as electrocardiograms (ECG), echocardiography, and other imaging tools. This narrative review was conducted with the aim of examining the applications, advantages, and challenges of using AI in the process of diagnosing heart diseases in humans.

Materials and Methods:
To gather reliable sources, a structured search was conducted in scientific databases including PubMed, IEEE Xplore, Scopus, ScienceDirect, and Google Scholar. The search used a combination of keywords such as "Artificial Intelligence," "Heart Disease Diagnosis," "Machine Learning," "ECG Classification," and "Medical Imaging AI." The timeframe for the studies was selected from 2015 to 2023. After screening the retrieved sources, articles that provided an experimental or review-based examination of the application of intelligent algorithms in identifying heart diseases were selected. A focus was also placed on studies that utilized real hospital data or reliable global datasets

Results:
The review of studies indicates that AI models have achieved acceptable accuracy in predicting or diagnosing heart diseases by using various data, from ECG signals to cardiac MRI images. Algorithms such as Convolutional Neural Networks (CNN), Support Vector Machines (SVM), and hybrid algorithms have shown good performance in classifying cardiac abnormalities. Some systems have even achieved an accuracy close to that of specialized physicians. However, challenges such as a lack of data quality standards, ethical issues, and a lack of algorithmic transparency in the medical field remain

Conclusion:
AI is becoming one of the main pillars of advanced heart disease diagnosis. Despite its high potential, the effective utilization of this technology requires an integration of clinical data, interpretable algorithms, and a precise evaluation in real-world settings. The future of cardiac diagnosis will be not only more technological, but also more data-driven and personalized.

Keywords:
Artificial Intelligence, Heart Disease Diagnosis

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Enhancing Quality of Life in Children with Congenital Heart Disease: The Pivotal Role of Pediatric Nursing and PedsQL Assessment

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Introduction:
Congenital heart disease (CHD) constitutes the most prevalent congenital anomaly, exerting a profound influence on the health-related quality of life (QoL) of affected children and their families. Pediatric nurses occupy a central position in orchestrating holistic care for this vulnerable cohort. This investigation appraises evidence-based nursing interventions alongside the deployment of the Pediatric Quality of Life Inventory (PedsQL) for evaluating and augmenting QoL in pediatric CHD patients, with the objective of delineating pragmatic strategies to refine pediatric nursing practices.

Materials and Methods:
A rigorous systematic review and qualitative synthesis were undertaken, amalgamating studies retrieved from PubMed, CINAHL, and Scopus databases spanning 2017–2025. Inclusion criteria incorporated randomized controlled trials (RCTs) and observational investigations emphasizing pediatric nursing modalities (e.g., family-oriented education, psychosocial support, and symptom management) and PedsQL application in children aged 2–18 years with CHD. From an initial pool of 245 studies, 68 high-caliber investigations were selected. Data analysis employed meta-analytic techniques and thematic qualitative synthesis.

Results:
Targeted nursing interventions, encompassing family-centered educational programs and psychosocial counseling, yielded statistically significant enhancements in PedsQL scores across physical)12.4±3.1) and emotional (15.2±2.8) domains. Nurse-initiated self-care education protocols diminished hospital readmission rates (HR=0.67, p<0.01) while bolstering medication adherence (>85%). The PedsQL instrument facilitated precise identification of individualized patient needs, thereby enabling bespoke interventional strategies. Multidisciplinary care frameworks anchored in nursing proficiency elevated family satisfaction levels by up to 90%.

Conclusion:
Evidence-based interventions in pediatric nursing, buttressed by validated instruments such as the PedsQL, confer substantial improvements in QoL for children with CHD. Prioritization of standardized educational and supportive protocols within pediatric cardiology settings is imperative. It is recommended that forthcoming international congresses convene to formulate global guidelines for seamlessly integrating these interventions into routine clinical praxis.

Keywords:
Congenital Heart Disease, Pediatric Nursing

Impact of nurse-led transitional care on hospital readmission in patients with heart failure: a systematic review

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Introduction:
Heart failure is a major global health challenge and one of the leading causes of hospital readmission (1). Preventing early readmission is crucial for improving patient outcomes and reducing healthcare costs. Nurse-led transitional care programs, including structured education, early follow-up, and telemonitoring, have been increasingly implemented to address this issue (2,3). The objective of this systematic review was to synthesize available evidence on the impact of nurse-led transitional care interventions on hospital readmission in adult patients with heart failure

Materials and Methods:
A systematic search was conducted in PubMed, Scopus, Web of Science, Embase, and Cochrane Library from January 2000 to March 2025. Eligible studies were randomized controlled trials and quasi-experimental designs that compared nurse-led transitional care interventions with usual care in adults diagnosed with heart failure. Interventions included structured discharge planning, patient and family education, post-discharge follow-up (telephone or home visit), and telemonitoring (3,4). Two independent reviewers screened titles, abstracts, and full texts, extracted data, and assessed methodological quality using the Cochrane Risk of Bias 2 tool for RCTs and ROBINS-I for quasi-experimental studies. Discrepancies were resolved by consensus. The primary outcome was hospital readmission at 30 and 90 days. Secondary outcomes included mortality, health-related quality of life, and adherence to self-care behaviors. A narrative synthesis was performed, and where sufficient homogeneity existed, random-effects meta-analysis was applied

Results:
Findings consistently demonstrated that nurse-led transitional care interventions reduced 30-day and 90-day hospital readmissions in patients with heart failure compared with usual care (1,2). Programs that combined structured education, early follow-up within 72 hours of discharge, and telemonitoring showed the strongest effects (3,4). Improvements were also reported in patient adherence to self-care and in quality of life scores. However, effects on mortality were mixed and varied across studies. Methodological

heterogeneity and variations in healthcare systems limited comparability, but the overall evidence strongly supports the effectiveness of nurse-led transitional care in reducing readmission

Conclusion:
Nurse-led transitional care is an effective strategy for reducing hospital readmission in patients with heart failure (1–4). Structured, multi-component interventions that include patient education, early post-discharge follow-up, and telemonitoring maximize benefits. While evidence for mortality reduction remains inconclusive, the positive impact on readmission and self-care highlights the central role of nurses in managing transitions of care in heart failure. Large-scale, high-quality trials are still needed to strengthen the evidence base and guide implementation in diverse healthcare settings.

Keywords:
Heart Failure, Nursing, Transitional Care.

Effectiveness of Nurse-Led Rehabilitation Programs Based on Remote Education for Elderly Patients Undergoing Coronary Artery Bypass Graft Surgery: A Narrative Review

Introduction:
Given the global rise in the incidence of coronary artery disease among the elderly and the associated mortality rates, coronary artery bypass grafting (CABG) has emerged as a practical surgical intervention for managing this condition. Although CABG offers numerous benefits, many patients face various psychological and social challenges postoperatively. Effective postoperative care plays a critical role in mitigating these challenges. Continuous follow-up by nurses constitutes an essential component of patient care, which can lead to improvements in patients' health behaviors and lifestyle. One effective method in this context is remote nursing care, including nurse-led telephone education and counseling.

Materials and Methods:
A systematic review was conducted across six databases (PubMed, Scopus, Web of Science, Embase, Consensus, and Google Scholar) for articles published between 2014 and 2024. The search strategy focused on keywords related to remote nursing care, coronary artery surgery, elderly patients, and rehabilitation, in both Persian and English languages. Inclusion criteria comprised studies that directly examined the impact of nurse-led remote rehabilitation programs on elderly patients undergoing CABG, while studies not meeting these criteria were excluded. Of the 20 articles identified, 11 relevant studies were reviewed, analyzed, and synthesized.

Results:
The mean follow-up period was approximately 3.75 weeks, and the average duration of interventions was 30 minutes. The studies indicated that nurse follow-up after discharge significantly improved patients' self-efficacy and management of complications. Most remote intervention programs were associated with enhanced physical activity, behavioral modification, risk factor correction, adequate nutrition, and psychosocial well-being.

Conclusion:
Nurse-led telephone counseling contributes to increased patient independence and improved lifestyle, thereby reducing postoperative complications. Therefore, it can be considered an effective strategy for promoting health outcomes in post-CABG patients. It is recommended that this approach be combined with e-learning programs to achieve greater effectiveness.

Keywords:
Remote nursing, rehabilitation, elderly

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Psychometric Validation of the Persian Version of the Post-Code Stress Scale Among Iranian Nurses

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Introduction:
Post-code stress represents a unique set of psychological challenges for nurses directly involved in cardiopulmonary resuscitation, encompassing professional, emotional, interpersonal, and organizational stressors. Although the Post-Code Stress Scale (PCSS) is the only instrument specifically designed to assess these experiences, no validated Persian adaptation has been available. This study aimed to translate, culturally adapt, and evaluate the psychometric properties of the Persian version of the PCSS for use among Iranian clinical nurses.

Materials and Methods:
A methodological study was conducted with a total sample of 500 nurses from diverse hospital units across Iran. The PCSS underwent forward–backward translation and cultural adaptation following established guidelines. Face and content validity were examined qualitatively and quantitatively. Construct validity was evaluated using exploratory factor analysis (EFA) on a randomly selected subsample of 200 participants, followed by confirmatory factor analysis (CFA) on an independent subsample of 300 participants. Reliability was assessed through Cronbach's alpha coefficients and test–retest intraclass correlation coefficients (ICC).

Results:
EFA supported a four-factor structure Professional Performance, Social and Interpersonal Pressure, Organizational Structure Challenges, and Emotional and Clinical Stress accounting for 61.9% of the total variance after removal of two low-performing items. CFA confirmed excellent model fit (CFI = 0.993, TLI = 0.992, RMSEA = 0.020, SRMR = 0.037) and strong convergent and discriminant validity. Internal consistency was acceptable to excellent across subscales (α = 0.81–0.90) and for the overall scale (α = 0.74). Test–retest reliability over a two-week interval indicated high temporal stability (ICC = 0.899, 95% CI: 0.790–0.952).

Conclusion:
The Persian PCSS demonstrated strong validity, high reliability, and cultural relevance for assessing post-resuscitation stress among Iranian nurses. Its multidimensional structure provides a robust framework for both clinical assessment and research, supporting early detection of psychological distress and the design of targeted interventions in high-acuity care settings.

Keywords:
Nurses; Stress; Cardiopulmonary Resuscitation; Psychometry

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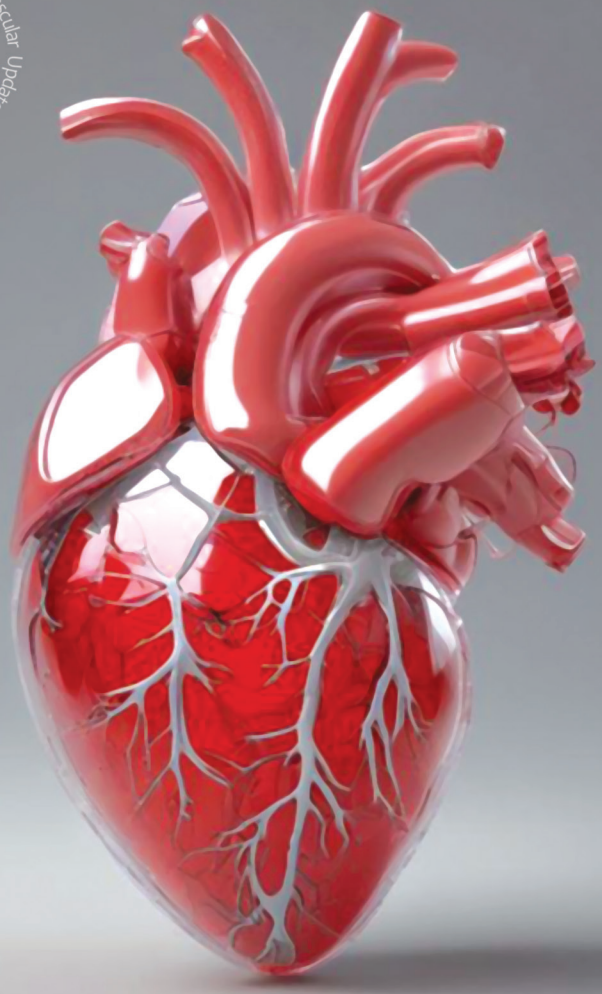

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