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Review Article

Assessing Cardiovascular Fitness on Military Recruitment

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ABSTRACT

Background: Military recruitment demands optimal health, with cardiovascular fitness being a key criterion. To assess candidates, military organizations worldwide employ standardized screening protocols. Initial evaluations typically involve history-taking and physical examinations based on guidelines from the American Heart Association and the European Society of Cardiology. **Method:** Electrocardiography (ECG) serves as an accessible and cost-effective screening tool. Abnormal findings in these initial tests necessitate further assessments to determine a candidate's fitness for service. Depending on the severity and context, additional tests such as echocardiography or, in rare cases, coronary angiography may be conducted. However, cost constraints influence the extent of these evaluations in some countries. **Aim:** This article examines cardiovascular screening in military recruitment and the variations in assessment practices across different nations.

Highlights:

1. This article addresses the importance of standardized yet flexible cardiovascular assessments essential for military screenings. While standardized protocols are essential for consistency, military screenings should also adapt to environmental factors, individual differences, and evolving fitness benchmarks to ensure accurate evaluations.

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Introduction

Under current protocol, all candidates on military are required to self-declare their medical history, collaborate with their general practitioner, undergo a physical examination, and have a resting 12-lead ECG recorded. Candidates who exhibit specific findings during initial screening process are required to undergo an additional transthoracic echocardiogram on the day of the screening. ECGs were not routinely obtained until April 2013, and the initial assessment relied on a standardized history and physical examination without immediate access to an echocardiogram.[1]

The importance of accurately identifying military applicants (officer and enlisted) with cardiovascular disease is difficult to exaggerate. Many of the conditions likely to be detectable on screening ECG are known causes of SCD in active-duty military populations. In the context of SCD epidemiology in the military, ECG may detect pathology in over 75% of the known causes of sudden cardiac death (SCD), and potentially over 90% if postmortem idiopathic causes are related to arrhythmic etiology. Yet, there are several important conditions, such as anomalous coronary arteries, which would not be detectable with ECG. Nonetheless, universal ECG screening is not a component of current medical evaluation of military applicants.

Current cardiovascular screening of military applicants includes a DoD-specific history and physical examination to screen for cardiovascular disease. After 2002, the ECG became an optional modality available Military Entrance Process Station (MEPS) physician with clinical concern for underling cardiovascular disease in enlisted recruits and similarly for officer candidates obtaining medical evaluations for the DODMERB. Nevertheless, a preparticipation resting 12-lead ECG remains a requirement for all applicants before enrollment in high-intensity military training programs such as the survival, evasion, resistance, and escape course; and entrance into elite military units such as the US Army Rangers or US Navy Seals.[2]

Military Screening

American Heart Association and European Society of Cardiology are the two most widely used guidelines observed in cardiac pre-participation screening programs, despite variety in body weight and height in various ethnicity and nation. The assessment process delineated within the article involves a comprehensive examination of candidates' cardiovascular health, encompassing various diagnostic tests, physical examinations, and medical histories as shown in central figure. History and physical examination have traditionally been the cornerstone of screening for cardiovascular diseases, and both guidelines recommend a structured history taking (Table 1) and physical examination. The history aims to uncover symptoms or family history that the patient might not have

previously recognized as significant. The physical examination primarily focuses on identifying structural heart diseases. While it is commonly used, ensuring that clinicians can detect significant abnormalities and that their findings are reproducible remains a challenge.

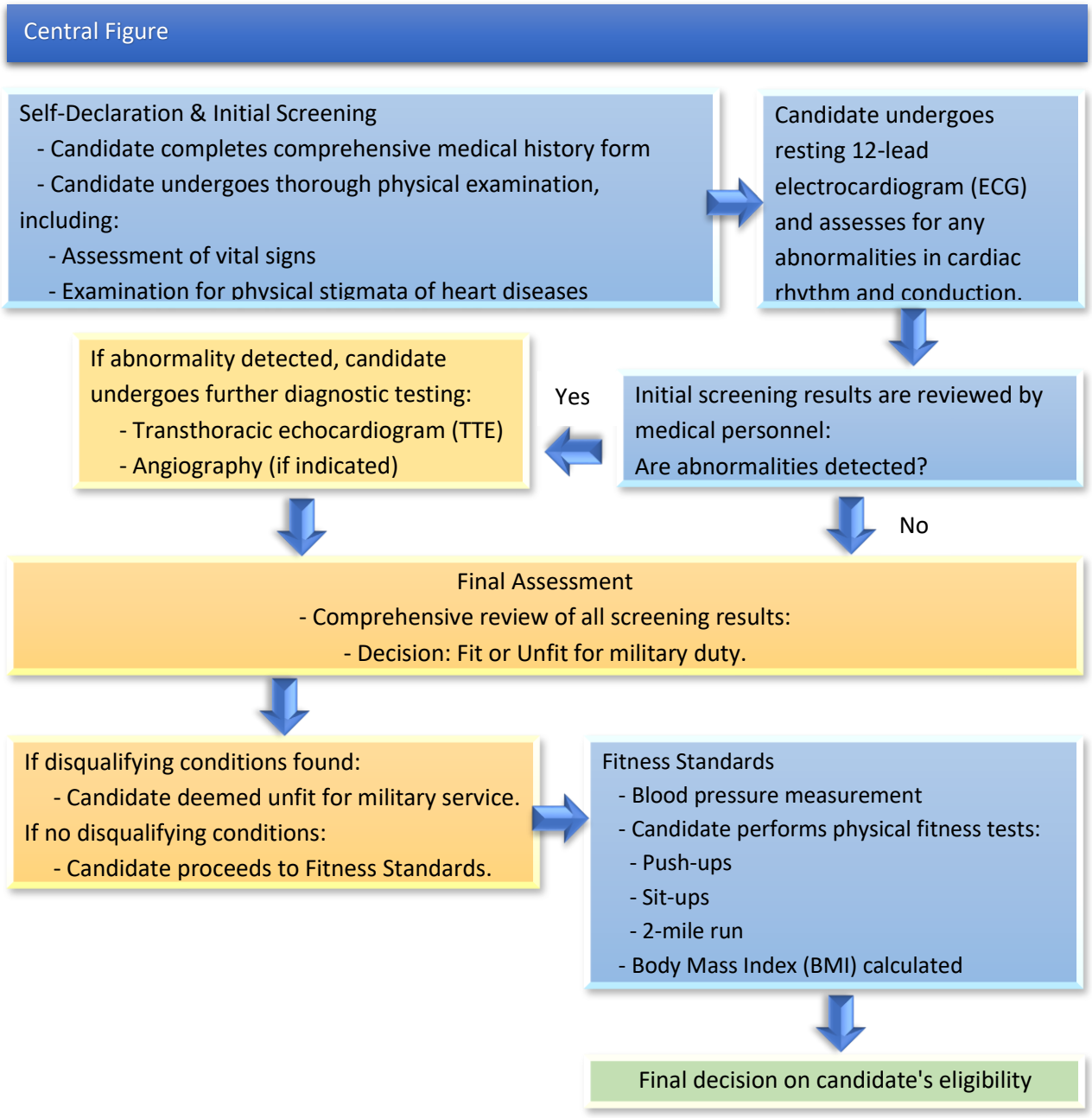

Figure 1. Cardiovascular assessment process in military recruitment

Table 1. The Recommended Questions and Physical Examination Outlined in The American Heart Association Guidelines

Personal medical history
1. Exertional chest pain/ discomfort 2. Unexplained syncope/ near-syncope* 3. Excessive exertional and unexplained dyspnoea/ fatigue, associated with exercise 4. Prior recognition of a heart murmur 5. Elevated systemic blood pressure
Family medical history
1. Premature death (sudden and unexpected, or otherwise) before age 50 years due to heart disease, in ≥ 1 relative 2. Disability from heart disease in a close relative < 50 years of age 3. Specific knowledge of certain cardiac conditions in family members: hypertrophic or dilated cardiomyopathy, long-QT syndrome or other ion channelopathies, Marfan syndrome or clinically important arrhythmias
Physical examination
1. Femoral pulses to exclude aortic coarctation 2. Physical stigmata of Marfan syndrome 3. Brachial artery blood pressure (sitting position and in both arms)

*Particularly during exertion and not thought to be neurocardiogenic in origin.

Table 1 shows the recommended questions and physical examination outlined in the American Heart Association (AHA) guidelines.[1]

Candidates with a family history of heart disease, hypertension, significant symptoms, or other physical examination abnormalities (except murmurs), are referred to their general practitioner. Candidates who have an isolated murmur detected during auscultation are directly referred to a cardiologist for an ECG and echo.

Approximately 8% of cases were found to have a murmur during the screening process, leading to delays in their selection for the British Army until they were cleared of any disease. These delays resulted in additional administrative costs, and the system was perceived to be expensive, leaving room for potential efficiency savings.[1]

Disqualifying Cardiac Disease based on ECG

Sudden death is catastrophic for the individual, but incapacitation because of a nonfatal illness (such as supraventricular tachycardia) can compromise a critical mission and jeopardize many more lives. The current Department of Defense Instruction (DoDI) 6130.03 classifies disqualifying heart conditions into 19 categories covering structural, electrical, and vascular heart conditions that may directly interfere with expected performance within military service. It is worth nothing that many asymptomatic but disqualifying heart disease conditions (such as latent hypertrophic cardiomyopathy or Wolff Parkinson White) may be detectable only on a screening.[2]

Table 2. Disqualifying Cardiac Disease Potentially Identified by ECG Screening

ECG Likely to identify	ECG Not Likely to identify
Atherosclerotic coronary artery disease	
Hyperthrophic cardiomyopathy	Coronary anomalies
Arrythmogenic right ventricular cardiomyopathy	Catecholaminergic polymorphic ventricular tachycardia syndrome
Long/ Short QT syndrome	Idiopathic ventricular fibrillation
Brugada syndrome	Commotio cordis
Congenital AS	
Myocarditis (if concomitant myopericarditis)	

Table 2 shows disqualifying cardiac disease which potentially identified by doing an ECG screening.[2]

Cardiovascular Screening Strategy

Current cardiovascular screening of military applicants includes a DoD-specific history and physical examination to screen for cardiovascular disease. In 2002, support for obtaining a compulsory resting 12-lead ECG was withdrawn by then Assistant Secretary of Defense for Health Affairs, Dr. William Winkenwerder.[2]

Blood Pressure

Alice, et al., concluded that the occurrence of optimal blood pressure was significantly lower among active-duty army members compared to the NHANES group, with rates of 30% and 55% respectively. This was surprising as the military's screening process eliminates individuals with high BP. Heightened BP readings might partly stem from the stress of military encounters like combat deployments, as well as the use of tobacco and alcohol, or irregular eating habits due to extended working hours. Notably, soldiers who reported multiple combat exposures are 1.33 times more prone to hypertension compared to their counterparts. These results underscore the importance of targeted intervention programs to maintain healthy BP and address varying levels of BP concerns in both military and civilian populations.[3]

ECG screening strategy

The current Department of Defense (DoD) screening strategy employs a mandatory history and physical examination to assess cardiovascular risk in eligible enlisted recruits at a Military Entrance Process Station (MEPS) site. An initial prescreen questionnaire contains self-reported data elements and requires explanations for positive answers. The military prescreen queries for “periods of unconsciousness”, “fainting spells or passing out,” but does not address the American Heart Association (AHA) elements “exertional chest pain/discomfort” or “excessive exertional and

unexplained dyspnea/fatigue, associated with exercise". When clinical concern for underlying cardiac disease arises, the MEPS provider may order an ECG to determine service qualification. However, if the mandatory military screening does not identify abnormalities concerning for cardiac condition, no further cardiac risk assessment is necessarily required.[2]

In an epidemiology study by Choon Ta Ng, et al. about the prevalence of electrocardiographic abnormalities in an unselected young male multi-ethnic Southeast Asian population undergoing pre-participation cardiovascular screening results of the Singapore Armed Forces Electrocardiogram (SAFE) and Echocardiogram screening protocol determined that the prevalence and spectrum of ECG abnormalities in a young male Southeast Asian population was 7% from 18.476 young male conscripts from October 2008 to May 2009 were age range from 16 to 27. Abnormal ECG findings vary from screened hypertrophic cardiomyopathy, Brugada Syndrome (0.10%), Wolff-Parkinson-White (WPW) pattern (0.14%), long QTc (0,17%), and other ECG abnormalities. Based on the study, racial distribution is also one of the variables that influence the ECG abnormalities findings. The prevalence of ECG abnormalities was significantly higher in Chinese than in South Asians (7.2 % vs. 5.7%, p< 0.003).[4]

Eliminating ECG in Military Recruit Screening

Given the relatively high rate of sudden death among recruits, the military would seem to be an appropriate context to reintroduce ECG screening. The rationale for eliminating universal screening was not given in the 2002 memorandum, but may represent a perception that the ECG was too expensive or insufficiently specific.

Acknowledging ECG and even echocardiography may reveal important pathologies (such as cardiomyopathy), the authors assessed difficult-to-screen conditions such as anomalous coronary artery would require cardiac catheterization to effectively diagnose. Such broad considerations contributed to the estimate of $4 million by the air force to prevent one cardiac-related death if implementing compulsory ECG screening. This figure assumes ECG false-positive rates before modern interpretation criteria and an expanded aperture of cost. The authors consider cost of cardiac catheterization for diagnosing anomalous coronary artery, a condition unlikely to be discovered using available screening tools.[2]

Physical Fitness

Intensive exercise training is recognized for its ability to enhance cardiovascular disease risk factors, promote weight loss, reduce visceral fat area, and elevate cardiorespiratory fitness. This improvement

is linked to decreased long-term mortality rates and higher levels of health-related quality of life.

The current systematic review demonstrates the existence of various assessment methods and tests to evaluate physical fitness within military and security forces. The most common fitness test batteries include evaluations of cardiorespiratory fitness, musculoskeletal fitness and body composition[5]. For example, a study by Kimberly, et. al. analyzed the general physical profile of U.S. Air Force (USAF) special warfare candidates by assessing body composition results and physical assessment scores collected from 1,036 male candidates who were 18.2 years to 39.5 years old.[6]

Table 3. Anthropometric and Body Composition Profile of Candidates

	N	Mean	SD	Range (min-max)
Height (cm)	1,036	177.4	6.5	159.5 – 195.8
Body mass (kg)	1,036	78.8	8.3	54.5 – 106.5
BMI (kg/m^2)	1,036	25.0	2.0	19.0 – 31.4
Lean mass (kg)	1,036	69.6	7.6	47.7 – 94.8
FFMI (kg/m^2)	1,036	22.1	1.6	16.9 – 27.2
Skeletal muscle mass (kg)	1,036	39.8	4.5	26.6 – 54.4
Fat mass (kg)	1,036	9.3	2.9	2.1 – 25.4
Percent body fat (%)	1,036	11.8	3.3	3.0 – 31.0

Table 4. Candidate Fitness Test Scores and Passing Standards

	N	Mean	SD	Minimum Passing Standard
Board jump (cm)	775	249.0	182.9 – 322.6	190.5
Agility test (left) (sec)	776	4.9	4.3 – 5.6	5.75
Agility test (right) (sec)	776	4.9	4.3 – 5.8	5.75
3 repetition deadlift (kg)	776	155.9	102.7 – 184.1	102.3
Pull-ups (repetitions)	775	14.8	5 – 34	8
Farmer's carry (sec)	775	20.1	15 – 28	31
300 yard shuttle (sec)	776	67.3	60 – 78	82.5
1,500 m swim (sec)	774	1,896.1	1,387 – 2,852	2,630
3 mile ruck (sec)	776	2,327.9	1,605 – 2,808	≤ 3,000

Table 3 shows anthropometric and body composition profile of candidates, while table 4 shows candidates fitness test scores and minimum passing standards of its section.[6]

Cardiorespiratory fitness stands as an important component of the training program and is recognized for its role in preventing chronic illnesses. The majority of analyzed fitness test batteries (such as Army Physical Fitness Tests, Physical Readiness Test, Assessment of Recruit Motivation and Strength, etc.) incorporate at least one assessment of cardiorespiratory fitness. The primary measure used to assess cardiorespiratory fitness is maximal oxygen consumption (VO_2max), with maximal

exercise tests like the 12-minute run and 20 m shuttle run test showing high correlation coefficients of 0.92 and 0.86 respectively with treadmill VO_2max. Nonetheless, the 12-minute run or distance running tests (e.g., 2.4 km run or 3.2 km run) have demonstrated challenges in determining optimal speeds for inexperienced runners. Another distinction among the tests is the equipment required. Incremental treadmill runs or Wingate cycle-ergometer tests necessitate specialized equipment, which can be used individually or by small participant groups. This issue is solved in the 12-minute run or the 20 m shuttle run test, making the choice of test dependent on available equipment and the number of participants able to undertake the test simultaneously.[5]

It is useful to compare the civilian workplace with the military work setting in terms of the role and treatment of physical ability. The first is that while physical performance is relevant for 100 percent of military jobs (since basic military training is a requirement for all), it is a factor in only a relatively limited set of civilian jobs. The second is that while the military at present adopts a strategy of training to develop physical ability, rather than selecting for physical ability, civilian employers generally use a strategy of selecting for physical ability.

Hogan notes the use of two approaches to physical testing in the workplace, which use two very different types of tests. The first focuses on simulating the performance of a job-specific physical task (e.g., a firefighter dragging a hose, climbing a ladder). This approach relies on the fidelity with which the test matches exact job conditions as the basis for establishing the content validity of the test. In other words, the basis for the inference that the test is job-relevant is established on logical grounds due to the similarity of test content and job content. The second focuses on measurement of more fundamental physical constructs (e.g., muscular endurance, cardiovascular endurance). This approach uses job analysis to identify physical constructs that appear to be relevant to effective job performance and then examines empirical relationships between individuals' scores on tests of those constructs and measures of criteria of interest (e.g., job performance).[7]

History of Army Physical Fitness Test

In 1858, the first recorded Army physical fitness assessment was implemented for cadets at the United States Military Academy. This test required cadets to climb a 15-foot wall, vault a 5-foot-tall horse, leap a 10-foot-wide ditch, run a mile in 8 minutes or run 2 miles in 18 minutes, walk 4.5 miles in an hour, and walk 3 miles in an hour while carrying equipment that included a 20-pound knapsack. The most recent APFT was implemented in the 1980s and consisted of push-ups, sit-ups, and a 2-mile run.

Table 5. Standards and Associated Scoring per APFT Event for Individuals Aged 17 to 21

Event	Standard Needed to Receive 100 Points (maximum score)		Standard Needed to Receive 60 Points (minimum passing score)	
	Male	**Female**	**Male**	**Female**
Pushups	71 pushups in 2 minutes	42 pushups in 2 minutes	42 pushups in 2 minutes	19 pushups in 2 minutes
Situps	78 pushups in 2 minutes	78 pushups in 2 minutes	53 pushups in 2 minutes	53 pushups in 2 minutes
Run	2 miles in 13:00 minutes	2 miles in 15:36 minutes	2 miles in 15:54 minutes	2 miles in 18:54 minutes

Table 5 shows the standards required to receive the maximum (100) and minimum passing score (60) points per event for individuals aged 17 to 21.[8]

Physical fitness assessments have generally been used to establish a baseline measure for Service members. Most commonly, these assessments are used during recruitment. These assessments establish entrance standards, providing a baseline assessment to determine an applicant's ability to begin training for military service. These assessments commonly included core exercises, strengthening activities, and cardiovascular exercises.

Table 6. Physical Fitness Assessment Activities for Foreign Armies by Country

Country	Core				Strength								Cardiovascular		Other
	Situps	Back Exercises	Side/Back Bridge	Lunges	Dips	Pullups	Pushups/ Pressups	Long/Vertical Jump	Deadlift or Other Lift	Chin Hang	Ball Throw	Plank*	Object Carry	Run	Shuttle Run	Balance Activity
Australia	X															
Canada																
Denmark																
Finland																
Germany																
Ireland																
Israel																
Netherlands																
New Zealand																
Norway																
Phillipines																
Poland																
Singapore																
Sweden																
Switzerland																
United Kingdom																
United States																

Notes: Some countries implemented multiple physical fitness assessments; in those cases, the activities associated with the general physical fitness assessment are included in the table. Alternate activities for those with medical waivers not exemptions are not included in the table.
*In Switzerland the plank is used as a measure of core strength; however in Denmark it is used as a measure of arm strength.

Table 6 shows each countries physical fitness assessment activities for foreign armies.[8]

Cardiovascular activities are defined as activities that promote an above-average heart rate. Running was the commonly included cardiovascular activity in the physical fitness assessment. In fact, every country except for Switzerland included running in its assessment. The primary objective of conducting running events is to measure the participant's aerobic capacity. Many foreign militaries deemed aerobic fitness as an essential component of many if not all military tasks, and an important tool for injury prevention and overall health and fitness. Activities varied across countries, but the most common were sprints, shuttle runs, and distance running. For example, the United Kingdom's army required a 1.2-mile run after an initial half-mile warmup jog. Germany required both a distance run and a sprinting activity for its entry physical fitness assessment. Some countries provided alternative

cardiovascular activities for trainees and Service members who could not complete one of the cardiovascular components because of exemptions. For example, Finland, Denmark, and Canada provided alternative activities. In Canada, an approved alternative to the shuttle run was a step test, and the Finnish army's alternatives to measuring aerobic fitness were a bicycle ergometer test and a walk test.

The scoring and implementation of physical fitness assessment tests varied greatly for ground forces around the world. To highlight the variations, this section details how age and gender affected the scoring and implementation of physical fitness assessments in three countries: Australia, Canada, and Norway. These countries were selected because they used a variety of gender-adjusted and gender-neutral physical fitness assessments and scoring measures, uses, and research surrounding the effectiveness of their assessments.[8]

Cardiovascular-Related Diseases and Its Impact in Military Forces

Arrhythmia

Military duty is also inherently associated with harsh disciplinary processes, long working hours, unsuitable climatic and topographic circumstances, and fright of enemy action, all of which increase the risk of arrhythmias. Symptomatic arrhythmias may limit the ability of military personnel to execute essential duties in various military occupations, impacting military readiness, deployment eligibility, and overall retention capacity. Therefore, those with illnesses are unfit for military services and should be dismissed.

Heart conduction system disease was found in 0.7% of all participants, and supraventricular tachycardia was the most common disease that was missed (0.3%) during the medical exam before mandatory military service.

Arrhythmia can occur in a structurally normal heart. Hasija et al. diagnosed 15 recruits with supraventricular tachycardia between 2014 and 2016 at an Indian military hospital[10]. Brugada syndrome, which causes sudden cardiac death during exercise, is observed in 1% of young people. This is rare in military recruits. Guettler et al. detected it in only one patient among a 300-man German aircrew[11]. Murphy et al. diagnosed Wolff-Parkinson-White syndrome (WPW) in seven and Brugada syndrome in one of the recruits. In the American army, 386 paroxysmal atrial fibrillations (AF) emerged in 15 years of follow-up, 40% of which were deployed[11]. The side effects of medications and endocrine abnormalities can lead to arrhythmia. Anti-histaminic agents may cause sudden death owing to QT prolongation. Another agent that prolongs the QT interval, which is also accepted by neuropsychiatrists, is anti-psychotics. Metabolic syndromes can also cause arrhythmia. Metabolic

syndrome was detected in 24.3% of the Saudi army population, and 578 of them had frequent premature atrial contractions. In a study by Palle, 512 overweight recruits developed significant arrhythmias during exercise.[9]

Sudden Cardiac Death

At present, cardiovascular assessment of new recruits involves a targeted medical history and physical examination. In 2020, there were instances of sudden cardiac death (SCD) and a severe cardiac fainting episode at the U.S. Naval Academy (USNA), attributed to dilated cardiomyopathy, hypertrophic cardiomyopathy, and Brugada Syndrome respectively. To potentially detect cardiovascular issues that could lead to SCD, electrocardiogram (ECG) screening was introduced.

Incorporating ECG testing enabled the identification of uncommon but potentially life-threatening disorders with a high level of accuracy - a false positive rate of less than 2% - particularly among young and fit individuals entering demanding occupations. The conventional approach recommended by the American Heart Association (AHA) for cardiovascular screening proved insufficient in detecting worrisome conditions that could lead to SCD, underscoring its inadequacy for screening individuals at the USNA and those facing similar high-stress situations.[12]

A conference abstract by Abacherli, et. al., details a comparison of SCD in Swiss male military conscripts separated into age groups 16-19, 20-14, 25-29. The authors compare episodes of SCD after the initiation of ECG screening, compared to historical controls prior to ECG screening. A statistically significant reduction in the ECG screened 20-24 age group with a point estimate of 0.56 (CI: 95% 0.35 to 0.91) was reported. The same comparison in men aged 16-19 was found to be 0.89, and 25-29 was found to 1.04. These were described as nonsignificant, with only the point estimates, and no confidence intervals reported.

A systematic review and meta-analysis study by Aaron, et al. found that there is very low-quality evidence ECG screening decreases the risk of sudden cardiac death in young athletes and military members. However, caution is needed when considering this finding. Military studies were not meta-analyzed but showed a range of estimates from 0.98 to 11.36 SCDs per 100000 years.[13]

When we reviewed the included publications, it did appear that the incidence of SCD in military members may be more frequent than in athletes. The point estimates reported in the included studies ranged from 0.98 to 11.36 SCDs per 100,000 in the low-ROB military studies.[14]

Congenital Heart Disease

Around 1% of the population is born with congenital heart disease (CHD), and the number of Americans with palliated CHD who survive into adulthood continues to grow. Among the nearly 100,000 new military recruits every year, there is a subset with CHD who apply to serve. It is helpful for pediatric and adult congenital cardiologists to understand the basic qualification standards and administrative process required for their patients who may be interested in military service.

When considering who can join the military, two important criteria come into play: the ability to perform required physical duties and the ability to receive the standard of medical care.

With this in mind, the Department of Defense has specified comprehensive standards of medical fitness for entering the military, and the Air Force, Army, and Navy have set their own regulations particular to their branch. The Marine Corps falls under the Navy Bureau of Medicine, so Marine recruits follow Navy medical standards. These regulations state that congenital anomalies of the heart and great vessels, along with valvular disorders, are conditions disqualifying an applicant from military service — except in those conditions indicated in Table 1.[15]

Table 7. Service-Specific Regulations Pertaining to Select Cardiac Diagnose

	Air Force	Army	Navy & Marine Corps
Aortic insufficiency	If trace	Does not meet the standard	Does not meet the standard
Aortic stenosis	Does not meet the standard	Does not meet the standard	Does not meet the standard
Atrial septal defect	If corrected without residua	Does not meet the standard	Does not meet the standard
Bicuspid aortic valve	If no stenosis or insufficiency	If no stenosis, regurgitation, cardiomegaly or tachyarrhythmia	If no stenosis, regurgitation, cardiomegaly or tachyarrhythmia
Mitral insufficiency	If trace or mild	Does not meet the standard	Does not meet the standard
Mitral stenosis	Does not meet the standard	Does not meet the standard	Does not meet the standard
Mitral valve prolapse	If normal exercise tolerance and not requiring medical therapy	If no stenosis, regurgitation, cardiomegaly or tachyarrhythmia	If no stenosis, regurgitation, cardiomegaly or tachyarrhythmia
Patent ductus arteriosus	If ligated or occluded	If corrected without residua	If corrected without residua
Pulmonic insufficiency	If trace or mild	Does not meet the standard	Does not meet the standard
Pulmonic stenosis	Does not meet the standard	Does not meet the standard	Does not meet the standard
Tricuspid insufficiency	If trace or mild	Does not meet the standard	Does not meet the standard
Tricuspid stenosis	Does not meet the standard	Does not meet the standard	Does not meet the standard
Ventricular septal defect	If corrected without residua	Does not meet the standard	Does not meet the standard

Table 7 shows the service-specific regulations pertaining to select cardiac diagnose.[8]

Conclusion

In In conclusion, the assessment of cardiovascular fitness holds paramount significance in the context of military recruitments across nations. The amalgamation of diverse studies underscores the crucial role played by cardiovascular fitness in amplifying overall military prowess, ensuring operational success, and safeguarding the health of recruits.

This study highlights the need for standardized and context-specific testing protocols that align with the unique demands of military operations. As discussed, emerging technologies and innovative assessment tools provide promising avenues for refining the accuracy and efficiency of cardiovascular fitness evaluations. It is evident

that a nuanced approach, which takes into account individual disparities, environmental influences, and evolving fitness benchmarks, is essential for a comprehensive evaluation process.

Furthermore, the literature underscores the manifold advantages of optimal cardiovascular fitness in military recruits, ranging from enhanced physical resilience to improved cognitive capabilities.

Looking ahead, collaborative efforts among international military entities, researchers, and fitness professionals become paramount to establish a universal understanding of best practices and to foster continuous improvement in recruitment processes. Ultimately, prioritizing cardiovascular well-being not only contributes to the preparedness of military forces but also underscores a commitment to the enduring health and triumph of the individuals who commit to serve.

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