Application of Pre-Participation Screening Guidelines to Novice Masters Endurance Athletes

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Introduction:

- The explosive growth in endurance sports has given rise to a parallel increase in the number of older athletes competing in these events [1-2]
- Despite this increase in endurance sports there are no uniform guidelines for pre-participation evaluation (PPE) in athletes ≥35 y/o
- Furthermore, little is known regarding the use of existing guidelines in decision making among physicians

Methods:

- The MASTERS Athletic Study is a longitudinal, internet-based survey of training and health aspects of runners ≥35 y/o
- In the present study, we applied 2 currently available pre-participation screening guidelines to novice runners (<5 years of running experience) to determine who would be "screened in" for further evaluation and testing
- Screening guidelines applied:
  1. AHA/ACSM Pre-Participation Questionnaire (AAPQ)[3]
     - Recommends a pre-participation physician visit for all individuals who have prior cardiovascular conditions, symptoms or 2 or more risk factors
  2. AHA Pre-Participation Guidelines for Masters Athletes (AHA Masters)[4]
     - Recommends pre-participation ECG for all individuals ≥40 y/o who are planning high-level athletic training/competition
     - Recommends pre-participation stress testing for men (≥40 y/o) and women (≥50 y/o) who have 1 risk factor,
       - All individuals ≥65 y/o
- We assessed athlete/physician concordance with these guidelines (ie, were runners that "screen in" appropriately referred for further evaluation and were those that "screen out" appropriately cleared to begin training?)
- We determined the independent factors that were associated with athlete/physician decisions for further PPE and testing

Results:

- Of 5850 total survey respondents, 1457 reported <5 years running experience

Table 1. Participant Demographics and Running Habits

Characteristics (n=1457)	N	%
Age		
Mean, y (range)	44.5 (35-86)	
Gender		
Male	940	64.5
Female	517	35.5
Risk Factors		
Hypertension	167	11.5
Hypercholesterolemia	333	22.9
Diabetes meelitus	27	1.9
History MI	6	0.4
History of cardio- vascular dis.	34	2.3
Family history of CVD	577	39.6
Ever smoked	578	39.7
Running habits		
Have run marathon/ultramarathon	485	33.3
Participate in triathlons	230	15.8

CVD = cardiovascular disease, MI = myocardial infarction

Table 2. Completion of PPE and Testing Stratified by AAPQ Screening Results

Variable	AAPQ Screen IN* (n=614)	AAPQ Screen OUT* (n=843)	P-value
Pre-participation doctor visit	316 (51.5)	335 (36.4	<0.001
ECG	299 (48.7)	277 (30.1)	<0.001
Stress Test	136 (22.1)	97 (10.5)	<0.001
CAC/CIMT	62 (10.1)	27 (3.2)	<0.001

*Values listed as n (%)
AAPQ,AHA/American College of Sports Medicine Pre-participation Questionnaire, CAC = coronary artery calcium, CIMT = carotid intima media thickness, ECG = electrocardiogram

Table 3. Completion of Pre-participation ECG and Stress Testing Stratified by AHA Masters 2001 Guidelines Screening Results

	Screen IN	Screen OUT	P-value
ECG	458/1048 (43.7)	105/352 (29.8)	<0.001
Stress Test	122/495 (24.6)	111/962 (11.5)	<0.001

ECG = electrocardiogram

Figure 1. Screening yield of AAPQ for recommendation of PPE by healthcare provider

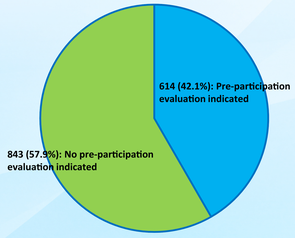


Figure 2. Screening yield of AHA Masters 2001 Guidelines for recommendation of PPE stress testing

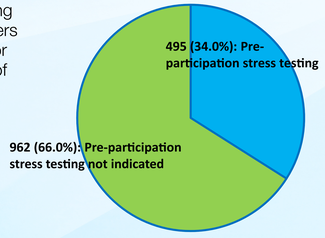


Figure 3. Forest plot illustrating independent predictors for PPE based on AAPQ simulation: Only athlete age was an independent predictor of PPE

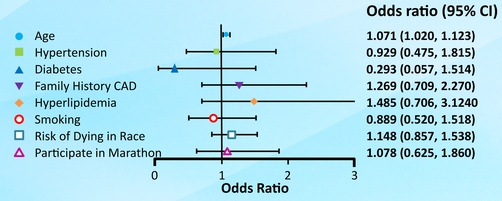
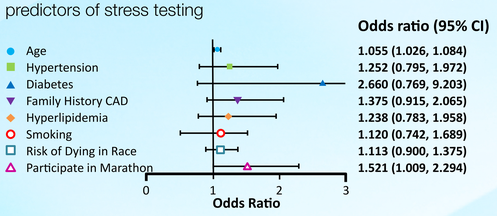


Figure 4. Forest plot illustrating independent predictors of stress testing based on AHA Masters 2001 Guidelines: Only athlete age and plan to complete a marathon/ distance event were independent predictors of stress testing



Conclusion:

- Application of AAPQ and AHA Masters Screening Guidelines yielded a substantial percentage of novice runners who "screened in" for further cardiovascular evaluation and testing (more than 1/3 for each screening guideline)
  - Given the low risk of running-associated cardiovascular events, it seems unlikely that application of these guidelines are a cost-effective method to screen novice runners for further PPE and testing
    - Further study is required to confirm this concept
- Overall, there was low healthcare provider concordance with these guidelines
  - PPE was not performed in a substantial percentage of athletes who were "screened in" for further testing
  - Conversely, a substantial percentage of athletes who were "screened out" received further evaluation that may have been unnecessary according to the guidelines
- Athlete age was a strong independent factor associated with PPE and testing,
  - Planning to complete a marathon or endurance event was also a strong predictor of pre-participation stress testing
- This study does not address the effectiveness of AAPQ and AHA Masters 2001 Guidelines to identify older runners who warrant further evaluation and testing in an accurate and cost-effective manner and further longitudinal follow-up will be required to address this question

Financial Disclosures:

The authors of this study have no personal financial disclosures.

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