

NEWS

# Single Troponin Test May Be Enough for Safe Discharge of Chest Pain Patients

Combined with the HEART score, a single negative test can identify patients with a low risk of short-term events.

BY **TODD NEALE** FEBRUARY 25, 2021



**A**ssisted by the HEART score, emergency physicians appear to be able to safely discharge patients with chest pain after just one negative conventional troponin test result, a retrospective cohort study suggests.

The 30-day rate of acute MI or cardiac mortality was similar regardless of whether patients had one troponin test or underwent

serial testing in the emergency department (0.4% in both groups), researchers report.

Clinical guidelines recommend serial troponin testing in patients presenting with symptoms indicative of ACS, but these findings suggest that a single negative test—when combined with risk-stratification tools like the HEART score and a physician’s clinical judgment—might be good enough, senior author Adam Sharp, MD (Kaiser Permanente Southern California, Pasadena, CA), told TCTMD.

“It’s certainly something to be considered, especially as people move to a high-sensitivity troponin,” said Sharp, who acknowledged that the observational study is not definitive. “We need to be thoughtful about not requiring that everybody receive two troponin tests, because I think if you were to speak to any practicing emergency physician, there’s just a lot of variability in the histories and the patients that come in to see us.”

There are no details on why physicians chose to obtain one or multiple troponin tests in the current study, Sharp added. “Nonetheless, under their discretion they did use one troponin, and safely.”

The study, with lead author Maereg Wassie, MD (Kaiser Permanente Southern California, Los Angeles Medical Center, CA), was published online February 23, 2021, in *JAMA Network Open*.

### **Most Patients Get One Troponin Test**

Despite guidelines supporting serial troponin testing for the evaluation of suspected ACS in the emergency department, several recent studies involving high-sensitivity troponin assays have provided evidence that suggests a single measurement can safely rule out ACS if the initial result is low—that includes a **large US study** and a **meta-analysis** of data from 10 countries.

Use of high-sensitivity troponin assays remains low in the United States, however, and some emergency physicians have started discharging low-risk patients after a single conventional troponin test result.

To explore the safety of this approach, the investigators evaluated data on patients presenting with chest pain to 15 community emergency departments within the integrated healthcare system of Kaiser Permanente Southern California between May 5, 2016, and December 1, 2017. The analysis included 27,918 patients (mean age 58.7 years; 58.1% women) who were evaluated with the HEART (history, electrocardiogram, age, risk factors, and troponin) score and underwent conventional troponin testing with the Access AccuTnI+3 assay (Beckman Coulter).

More than half of patients (51.8%) were discharged after a single test showed a troponin level below the limit of quantitation ( $< 0.02$  ng/mL), whereas 38.0% had two tests done and 10.2% had three or more done. Those who had only one measurement taken tended to be lower risk: they were younger and less likely to have various comorbidities, including hypertension, diabetes, lipid disorders, kidney failure, and congestive heart failure. Patients with lower HEART scores, indicative of lower risks of ACS or MACE, were more likely to be discharged after one troponin test.

The study's primary outcome was a composite of acute MI or cardiac mortality through 30-day follow-up, and after adjustment for cardiac risk factors and comorbidities, there was no difference based on the how many troponin tests were done (adjusted OR 1.41; 95% CI 0.96-2.07).

Looking at secondary outcomes, patients who were discharged after a single troponin test were less likely to undergo CABG (adjusted OR 0.24; 95% CI 0.11-0.48) or invasive coronary angiography (adjusted OR 0.46; 95% CI 0.38-0.56), differences Sharp attributed to the lower risk of the single-test group.

"This study suggests that physician discretion to order serial or single troponin tests in managing emergency department patients suspected to have acute coronary syndrome appears safe and is a reasonable strategy to possibly improve efficiency without an adverse association with patient outcomes," the investigators write in their paper. They note that "this strategy can prove useful in situations of high healthcare demand owing to increasing costs, emergency department crowding, or a limited resource setting, such as the [COVID-19]

pandemic.”

### **Reflective of US Practice?**

Sharp said that the high proportion of patients who received just one troponin test before discharge is likely consistent with what’s happening across the United States.

“When I see a patient that walks in and they’ve had chest pain for 12 hours, why keep them in the ER for another 3 hours to see if [the troponin’s] different after 3 hours? It just doesn’t really make any sense,” he said. He added, however, that if patients’ chest pain is severe or worsening, serial testing might be warranted.

Commenting for TCTMD, Barbra Backus, MD, PhD (Erasmus Medical Center, Rotterdam, the Netherlands), one of the authors of an accompanying editorial, said the study is noteworthy in that it shows that many emergency physicians in the United States are not routinely ordering multiple troponin tests for patients with suspected ACS.

And it “shows that when you do proper risk stratification with the HEART score, you can safely discharge patients with a single negative conventional troponin,” said Backus, who created the score. That strategy, which is not widespread in Europe, saves time and reduces crowding in the emergency department, she said.

It will likely take a prospective, randomized study showing that a protocol combining use of the HEART score and a single troponin test is at least as safe as performing multiple tests before guideline writers are likely to start recommending the approach, Backus predicted.

While awaiting such a trial, the one by Wassie et al “shows that when emergency physicians use a proper risk stratification [tool] such as the HEART score and have a low risk estimation for that patient with chest pain, if that is combined with a single negative troponin test it is safe to send your patient home,” assuming there are no concerns about other serious conditions like pulmonary embolism, she said.



BY **TODD NEALE**

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NEWS

# Exercise Outdoes Testosterone at Improving Vascular Function

A small randomized trial showed that the two options didn't produce additive benefits for cardiovascular health.

BY **CAITLIN E. COX** FEBRUARY 24, 2021



**M**iddle-age and older men with large waist circumferences and low/normal testosterone levels don't gain better vascular health when using cream to replace the hormone, but they do stand to benefit from a supervised exercise program, new data suggest.

This, along with a **growing body of literature**, flies in the face of the notion that testosterone therapy “is a restorative hormone that preserves health,” Lauren C. Chasland, BSc (The University of

Western Australia, Perth), and colleagues say. In 2015, the US Food and Drug Administration issued a **safety communication** urging caution when it comes to testosterone, only to be followed by more studies **suggesting the potential for harm**, even when **use is indicated**.

For this analysis, published online recently in *Hypertension*, the investigators had hypothesized that testosterone and exercise might, through dual mechanisms, have an additive, positive effect on vascular function. “[E]xercise training primarily upregulates the endothelium, and some evidence suggests testosterone treatment enhances vascular smooth muscle function in men with coronary artery disease,” they explain.

To their surprise, co-author Bu B. Yeap, MBBS, PhD (The University of Western Australia), told TCTMD, this wasn’t the case. “We had expected men receiving both testosterone treatment and exercise training to have the largest improvement in vascular function,” he said. “Instead, we found that while exercise training improved vascular function, testosterone treatment did not, nor did testosterone enhance the effect of exercise training.”

Michael Emery, MD (Cleveland Clinic, OH), said the question was an interesting one. Importantly, “they didn’t look at men that were truly pathologically hypogonadal,” he noted to TCTMD. “They looked at this sort of ‘gray zone’ of low/normal testosterone in older men, which is this huge target [for advertising].”

The takeaway, for Emery, is clear: “Yet again, exercise beats anything you can slather on yourself or take a pill for.”



**Yet again, exercise beats anything you can slather on yourself or take a pill for.**

Michael Emery

The 12-week study enrolled 80 men ages 50 to 75 years who had waists measuring  $\geq 95$  cm and serum testosterone levels of 6 to 14 nmol/L. In a 2x2 factorial design, participants were randomized to

transdermal AndroForte5 (testosterone 5.0% w/v, 100 mg/2 mL) or matching placebo and to supervised exercise (aerobic and strength, two to three times weekly) or no additional exercise. Current smokers and men already on testosterone or medications affecting testosterone level were excluded.

Self-reported testosterone adherence was 97.6%, and 96.5% of those assigned to exercise attended at least twice weekly. Hormone therapy increased serum testosterone levels, such that 62% of those receiving it had levels greater than 14 nmol/L, compared with 29% of those receiving placebo.

In terms of risk factors, neither testosterone nor exercise differentially affected body mass index, weight, waist circumference, glucose level, or HDL level. Hemoglobin A1c decreased slightly in both testosterone groups (ie, with or without exercise). Total cholesterol dropped with testosterone plus exercise but increased with testosterone alone. The hormone increased systolic BP, a difference the researchers attribute to a decrease in the placebo groups. Testosterone also was linked to increases in diastolic BP. With exercise, resting heart rate was reduced.

Data on vascular outcomes were available for 78 people. Flow-mediated dilation (FMD) rose with added exercise ( $P = 0.003$ ) but not with testosterone versus placebo ( $P = 0.111$ ). Neither option affected response to glyceryl trinitrate.

Mean FMD by Study Arm

|         | TESTOSTERONE<br>+ EXERCISE<br><br>(N = 21) | TESTOSTERONE<br><br>(N = 18) | EXERCISE<br><br>(N = 19) | NEITHER<br><br>(N = 20) |
|---------|--------------------------------------------|------------------------------|--------------------------|-------------------------|
| WEEK 0  | 2.7%                                       | 4.1%                         | 3.6%                     | 3.2%                    |
| WEEK 12 | 3.2%                                       | 3.4%                         | 4.6%                     | 3.4%                    |

Yeap said the gains seen here with exercise are likely to be significant. As to what physicians should tell their patients, he said the main message is that “if men want to improve the health of their arteries,

exercise (provided there are no medical concerns or physical limitations) would be the way to do it. Testosterone does not appear to improve vascular function, at least over a 12-week period of time.” In their paper, the authors go a step further, advising that “caution should be applied when prescribing testosterone if the primary aim is improvement in artery function and health.”

The group hopes to do a larger, lengthier study looking at other measures of heart health, Yeap said. “The important question remains: what is the effect of testosterone treatment on the coronary arteries and the heart?”

Emery pointed out that, while the observed effects of exercise training on endothelial function were small, this may be because the program involved what “appears to be moderate-intensity exercise below the current recommended levels” of 150 minutes weekly.

“What I see is that exercise continues to win,” he concluded, adding “any amount of getting off the couch and moving improves cardiovascular outcomes.”



BY **CAITLIN E. COX**

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