William Thornton

From: "Joe Kerwin" <medinaut@pdq.net>
To: "William E. Thornton, M.D." <jwthornt@msn.com>
Sent: Tuesday, March 11, 2008 11:56 AM
Attach: Comments on Treadmaill Testing.doc
Subject: Re: McMonigal email

Thanks, Bill. Attached is what I sent to Jeff, and I've already received a reply promising to revisit the decision.

Joe

From: William Thornton <jwthornt@msn.com>
Date: Mon, 10 Mar 2008 19:54:14 -0500
To: Joe Kerwin <medinaut@pdq.net>
Subject: McMonigal email

Joe: We were out today - McMonigal email is attached.

Thanks, Bill.

Hi Jeff,

I was astonished to receive a letter some days ago notifying me that Flight Medicine would no longer conduct exercise treadmill testing on retired astronauts. Mention was made of a possible substitute "to be named later" but my next physical (next week) will not test exercise response or physical fitness.

When I became Director of Space & Life Sciences in 1983, one of the first budget items I reviewed was the Longitudinal Study of Astronaut Health; the budget seemed a bit high, and not much was coming out of the project by way of scientific papers. I wondered whether it was worth the cost.

The ensuing discussion persuaded me to let it continue without protest. Its broad purpose was to document the health and fitness of astronauts from selection through flight and subsequent life, looking for any effects the weightlessness or the astronaut career might have on health and function. If neglected, this database could never be reconstructed.

Most physiological effects of space flight were expected to be short-lived – e.g. vestibular disturbances, weight loss and loss of muscle mass. Some might be of long duration and even have long latency – e.g. radiation effects and loss of bone density. The one thing we knew for sure was that our confident forecasts about response to weightlessness had been overturned in the past, and might be again. We should measure and keep measuring all the systems that are an important part of space adaptation.

And one of the top systems in that category is fitness, both cardiovascular and musculoskeletal. Fitness was and is a very significant selection criterion. Loss of fitness is a top threat in prolonged weightlessness, and exercise is the first, best, most essential countermeasure. So why stop measuring it in the LSAH?

I went to the web site referred to in the letter we got from Wyle, and downloaded the referenced statement from the U.S. Preventive Services Task Force (USPSTF), "Screening for Coronary Heart Disease." My review of it led me to the following conclusions:

1) The USPSTF report seems solely based on the sensitivity and specificity of the exercise tolerance test (ETT) as a screening device for coronary heart disease, not as a research measure. In other words, this is just preventive medicine.

2) Their recommendation against the use of the ETT in asymptomatic subjects seems to be based on the small yield of true positives in this population, and the potential risk to subjects, not from the test itself, but from false-positive tests leading to "unnecessary diagnostic testing, over-treatment and labeling." The risk of an adverse event during testing is not even mentioned in the report. In fact, the test is recommended for symptomatic individuals. So, the risk of incidents during the test itself is not a consideration, only the risk of follow-on testing.

3) Their bottom line is that "there is not enough evidence to determine the balance of benefits and harms of initial screening with ETT." This recommendation is basically one of cost-effectiveness of the test in a general population.

To repeat myself: exercise tolerance, physical conditioning and musculoskeletal status are extremely important factors in human response to space flight. Not to test for them calls the whole premise of the LSAH into question.

The argument has been made that changes in strength and endurance will not persist very long after space flight, and thus need mot be measured in retirees. But that's only an assumption, and only a long-duration follow-up can prove or disprove it. The fitness of astronauts during and after their careers is probably related; measuring the latter can help justify or modify standards and tests for astronaut selection and retention. And data of value to the general population may result (for example, the long-term effects of an emphasis on fitness.)

The Institute of Medicine, in its 2001 study, 'Safe Passage', thought retrospective data important enough that it advised NASA to offer comprehensive medical care to retired astronauts in order to get it. I wouldn't go that far (you'd go broke!) but this is the rationale for the LSAH. The LSAH may not have enough value to justify its cost. But if it is justified, there is no rationale for not including exercise stress testing as a part of it. Such testing might be refined or expanded. It should not be deleted.

Let me know what you think.

Thanks!

Joe

William Thornton

From: "William Thornton" <jwthornt@msn.com>
To: "Joe Kerwin" <medinaut@pdq.net>
Sent: Monday, March 10, 2008 9:37 AM
Subject: LSAH Treadmill

Joe:
Sent my comments to Davis and McMonigal. The latter said there would be a discussion of it. Yours are probably already in but if not they should add weight.

Bill.