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# NEWS

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The Changing of the Guard:  
New Co-Editors of ACSM's  
*Certified News* and New Ideas!

Page 2

Resistance Exercise for  
Cardiovascular Health and  
Coronary Patients

Page 3

Coaching News

Page 4

Review of the 2014  
Evidence-Based Guideline  
for the Management of  
High Blood Pressure  
in Adults

Page 5

Training Considerations  
for Novice Recreational  
Runners

Page 7

Physical Activity  
Monitors: New Tools for  
Practitioners and  
Their Clients

Page 9

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**In This Issue**

The Changing of the Guard: New Co-Editors  
Of ACSM's Certified News and New Ideas!.....2

Resistance Exercise for Cardiovascular Health  
and Coronary Patients..... 3

Coaching News..... x

Review of the 2014 Evidence-based Guideline for the  
Management of High Blood Pressure in Adults..... x

Training Considerations for Novice  
Recreational Runners..... x

Physical Activity Monitors: New Tools for Practitioners and  
Their Clients..... x

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# THE CHANGING OF THE GUARD: NEW CO-EDITORS OF ACSM'S CERTIFIED NEWS AND NEW IDEAS!

By Dierdra Bycura, Ed.D., and Yuri Feito, Ph.D.

**W**ith this edition, Yuri Feito, Ph.D., M.P.H., and I are starting our three-year term serving as co-editors for *ACSM's Certified News*. Dr. Feito is an assistant professor of exercise science in the Department of Exercise Science and Sport Management at Kennesaw State. Dr. Feito's tenure with ACSM started in 2007, as he was appointed to serve on the Exam Development Team (EDT). Since then, he has remained active in several ACSM committees and brings a strong clinical and public health background to this publication. He currently holds both ACSM clinical credentials and has been certified since 2002.

I'm Dierdra Bycura, Ed.D., and I currently serve as the program lead for the Fitness Wellness major and Health and Wellness Coaching minor in the Department of Health Sciences at Northern Arizona University. I am currently both ACSM Personal Trainer and ACSM Health Fitness Specialist certified. My service with ACSM started in 2004 when I was appointed to help create the certified personal trainer certification. Following that commitment, I was asked to serve on the Exam Development Team to create, review, organize, and revise exam items for all ACSM certifications. Yuri and I have a history of working together. I have appreciated his strong work ethic and camaraderie, and I knew that we would be a good team to help continue the strong work of previous co-editors!

We'd like to thank both Peter J. Ronai, M.S., and Pete Magyari, Ph.D., for their service as co-editors for the last several years wherein *ACSM's Certified News* has stayed consistently relevant and useful to us as readers. Over the past three years, they have invited authors to contribute their professional insights, which have aided our practice and expanded our knowledge.

Among the many highlights of this publication are the variety of authors who graciously agree to submit content that they see as timely and important to the practicing professional. It's always best when the question is asked, "What is on your mind with respect to practicing your profession?" Authors, time and again, have come up with interesting and important topics for us to consider as certified professionals charged to lead our field of practice.

As a new focus, we would like to have our readership more involved in suggesting topics for discussion and content for *ACSM's Certified News*. As such, we will be asking you, the readership, to submit questions to our columnists to guide their discussions toward information you are presently seeking. In addition, if you feel there is a topic that could use a more in-depth discussion, please feel free to submit ideas for our feature articles. We will be using ACSM's social media venues to gather some of that information, so make sure you follow them on Facebook, Twitter and/or LinkedIn. We will be posting questions there soon!

As always, we welcome feedback from professionals who would like to write and share their knowledge with other certified professionals. If you are interested in writing, please contact either Yuri (yfeito@kennesaw.edu) or me (dierdra.bycura@nau.edu) for author guidelines and scheduled deadlines for article submission.

# RESISTANCE EXERCISE FOR CARDIOVASCULAR HEALTH AND CORONARY PATIENTS

By Wayne L. Westcott, Ph.D.

**A**erobic activity is routinely recommended for improving cardiovascular fitness and heart health, and rightly so. However, research over the last several years has revealed that resistance exercise also is effective for enhancing cardiovascular health components and for reducing coronary risk factors. In fact, in an extensive review of the research literature, Strasser and Schobersberger concluded that “resistance training is at least as effective as aerobic endurance training in reducing some major cardiovascular disease risk factors (page 6).”<sup>22</sup> With respect to cardiovascular health, the beneficial effects of resistance exercise include improvements in resting blood pressure, blood lipid profiles, vascular condition, and glycemic control.

## Resting Blood Pressure

Hypertension affects approximately 35 percent of American adults.<sup>20</sup> Fortunately, research clearly shows that several weeks of standard and circuit-style strength training can significantly reduce resting blood pressure. For example, a study with more than 1,600 participants between the ages of 21 and 80 years revealed mean blood pressure reductions of 3.8 mm Hg systolic and 1.7 mm Hg diastolic after just 10 weeks of training.<sup>23</sup> In a large meta-analysis, Cornelissen and Fagart determined that resistance training studies showed average systolic blood pressure reductions of 6.0 mm Hg and average diastolic blood pressure reductions of 4.7 mm Hg.<sup>7</sup> Although the acute response to strength training is a linear increase in systolic blood pressure during a set of resistance exercise,<sup>25</sup> the chronic adaptation appears to be a significant decrease in resting systolic and diastolic blood pressure.<sup>24</sup>

## Blood Lipid Profiles

Approximately 45 percent of Americans have undesirable blood lipid profiles.<sup>17</sup> In a recent review, Kelley and Kelley reported that resistance training resulted in modest improvements in blood lipid profiles, except for high-density lipoprotein (HDL) cholesterol, which did not change significantly.<sup>16</sup> However, in the American College of Sports Medicine’s position stand on Exercise and Physical Activity for Older Adults, it was reported that strength training is associated with increases of 8 to 21 percent in HDL cholesterol, as well as 13 to 23 percent decreases in low-density lipoprotein (LDL) cholesterol, and 11 to 18 percent reductions in triglyceride levels.<sup>1</sup> It would therefore appear that resistance exercise may be an effective means for improving blood lipid profiles in adult men and women.

## Vascular Condition

Vascular condition is an indication of the arteries’ ability to accommodate blood flow, and therefore has a profound effect on blood pressure. Although the information on strength training and vascular condition is inconsistent, three relatively recent research studies have shown enhanced vascular (blood) conductance following programs of resistance exercise.<sup>4,9,19</sup> It is therefore possible that properly performed strength training may positively influence vascular condition.

## Glycemic Control

Poor glycemic control leads to type 2 diabetes (predicted to affect 30 percent of adults by the middle of the century),<sup>5</sup> which is a potential precursor to cardiovascular disease. Several studies have demonstrated significant improvements in insulin resistance and glycemic control resulting from regular resistance exercise.<sup>6,8,14,22</sup> In a comprehensive review article, Flack and associates concluded that resistance training may be an effective intervention for middle-aged and older adults to counteract age-associated declines in insulin sensitivity and glycemic control.<sup>12</sup> Consequently, strength training may reduce the risk of type 2 diabetes and related cardiovascular health problems.

## Coronary Patients

Just as there is substantial support for the cardiovascular benefits of resistance exercise, there is sufficient evidence to recommend strength training to persons who have coronary artery disease. Research has revealed that appropriately designed resistance exercise programs are safe and effective for post-coronary patients.<sup>24</sup> As early as 1986, medical researchers discovered that circuit strength training could be safely performed by cardiac patients, and produced significant increases in both muscular strength and cardiovascular endurance after just 10 weeks of training.<sup>15</sup> Numerous studies have shown similar beneficial effects for strength training in post-coronary participants,<sup>10,13,21</sup> including disabled older female cardiac patients.<sup>3</sup>

A 2007 study that compared strength training alone, aerobic training alone, and combined strength and aerobic training in people with chronic heart failure found that all three training modalities were equally effective for increasing cardiac function, exercise capacity, peripheral muscle function, and quality of life components.<sup>11</sup> However, more recent research with coronary artery disease patients revealed greater improvements in  $\text{VO}_2$  peak, muscular strength, muscular endurance, and body composition from combined strength and aerobic training than from aerobic training alone.<sup>18</sup>

*Resistance Exercise (continued on page 11)*

# COACHING NEWS

By Margaret Moore (Coach Meg), MBA

**T**oday's article continues a popular format for our Coaching News column, exploring a variety of interesting and challenging client scenarios. I describe a few tips from my science-based coaching toolbox to help you help your clients engage fully in a fit lifestyle that allows them to thrive, whatever thriving means in their lives.

"Most of my clients have been in their 20s and 30s. Working with clients who are post-retirement age is new for me. What tips do you have for working with this population?"

In a fast-paced culture that places a high value on youthfulness, technology, and peak performance, the interests, needs, and perspectives of senior clients are easy to misjudge or overlook.

## Listen and learn.

What everyone needs, no matter what our age, is to be respected, appreciated, and heard. Social connections are vital to keeping us going with a health-giving lifestyle. Additionally, opportunities to connect and engage with people and the world often decrease as we age. Your client's time with you may become a precious opportunity for social connection in his/her life.

Slow down, be present, listen, and be genuinely respectful and compassionate. It's hard to imagine being old when we are young, but do your best because it's only a matter of time before you will be old too. Each person brings a unique history, stories, wisdom, and knowledge. Honor his/her history, stories, and wisdom, even if they have nothing directly to do with exercise. We all learn important life lessons from spending quality time with our elders.

It is too easy to make assumptions about senior clients: what they can and can't do, their goals and motivation. Listen first. Keep an open and curious beginner's mind at all times.

## Value and appreciate what they know.

Clients who have experienced decades of life have earned decades of life experience, which demands a whole lot of appreciation and respect from younger professionals. A coach's starting point is to explore, appreciate, and value existing knowledge, skills, and experience well before collaborating on what new knowledge and skills are called for now.

Older clients may have experimented with many diet and exercise fads or programs. They have hard-earned insights on what worked and what didn't. Explore their memories of physical activities, even ones from decades ago. "What kinds of physical activities have you enjoyed or what worked best for you, even a long while ago?" and "What healthy habits worked for you the most in the past?" or "What accomplishments have you made in work and life that showcased strengths that you bring to this new adventure?" Having clients recall past successes invigorates their confidence for new opportunities ahead. When you start

by calling out and valuing a lifetime of learning, you show you value their wisdom.

Be deeply present, genuine, and sincere in your respect. Then your relationship is positioned to help a senior client lead his/her own journey of getting and staying fit, fostering much-desired autonomy in senior years.

## Explore meaning and purpose for being fit.

One's deeper, heartfelt purpose for being fit and strong is the most powerful kind of motivation, and particularly relevant to fitness goals for seniors. At this life stage adding life to years, not just years to life, becomes more important. Morbidity and mortality feel real, and who knows, they could be just around the corner. Seniors are not looking forward to the inevitable life step-downs to the end, losing independence and freedom at every step.

Spend quality time exploring why getting fit is important now. Get out of sales and into fishing, as motivational interviewing trainer Robert Rhode advises. How would more strength, flexibility, balance, and vigor allow your older clients to live life as fully as possible—continue driving, living in their own homes, taking care of themselves, walking without aid, and maybe even avoiding or delaying a debilitating event like a heart attack or stroke? Help them connect a higher fitness level to things they now value most.

## Look for role models – they are likely not the same as yours.

Often posters of fit 20 to 40 year olds in skimpy exercise clothes are posted throughout the gym to inspire clients to work harder. These images aren't likely to interest or energize senior clients as role models. One of the proven strategies for igniting confidence is to identify role models to whom they can really relate—people in their 60s, 70s, 80s, and 90s who are healthy, fit, and fully alive. Good role models help clients be more confident in several ways: clarify the new health and fitness habits they want to create, improve the effort they will invest, and extend the time they will keep at it in the face of inevitable challenges.

## Share the main findings of neuroscientists on taking good care of an aging brain.

Neuroscientists are teaching us about the many activities that help the brain age well, not prematurely. Our biggest fear as we age is that we will lose our minds. This is where you can use your expert hat, exploring what senior clients know and don't know about keeping their brains working well. Exercise is now the most-respected activity to delay terrible brain diseases like dementia and Alzheimer's disease. A decline in curiosity is one of the early signs of Alzheimer's disease. Encourage senior clients to try new activities and adventures. Learning new skills, like a new exercise class or routine, is a great way to invigorate

*Coaching News (continued on page 11)*

# REVIEW OF THE 2014 EVIDENCE-BASED GUIDELINE FOR THE MANAGEMENT OF HIGH BLOOD PRESSURE IN ADULTS

By Robert Berry, M.S.



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In December 2013, the Eighth Joint National Committee (JNC 8) published new guidelines for the management of hypertension in adults.<sup>1</sup> The panel, which included individuals with expertise in hypertension, cardiology, primary care, nephrology, evidence-based medicine, and epidemiology, as well as other areas, was tasked to develop evidence statements via a systematic review of the available literature. Three questions guided this review (Table 1):

**Table 1: Questions used to guide evidence review.**

1. In adults with hypertension, does initiating antihypertensive pharmacologic therapy at specific blood pressure (BP) thresholds improve outcomes?
2. In adults with hypertension, does treatment with antihypertensive pharmacologic therapy to a specified BP goal lead to improvements in health outcomes?
3. In adults with hypertension, do various antihypertensive drugs or drug classes differ in comparative benefits and harms on specific health outcomes?

The panel focused the evidence review to only randomized clinical trials (RCT) and only included those RCTs that examined the effects of the studied intervention on major health outcomes including, but not limited to, overall mortality, cardiovascular disease related mortality, chronic kidney disease (CKD) related mortality, myocardial infarction, heart failure, hospitalization for heart failure, stroke, coronary revascularization, peripheral revascularization, or end-stage renal disease.

## Recommendation 1:

In the general population aged 60 years or older, initiate pharmacologic treatment to lower systolic blood pressure (SBP) of 150 mm Hg or higher or diastolic blood pressure (DBP) of 90 mm Hg or higher and treat to a goal SBP lower than 150 mm Hg and goal DBP lower than 90 mm Hg.

Although somewhat controversial among the panel, the evidence suggests that there is no additional benefit to treat hypertension to an SBP goal of less than 140 mm Hg. Ultimately, the panel agreed that the evidence supporting recommendation 1 was very strong and decided to include a corollary recommendation that treatment for hypertension need not be adjusted if treatment results in SPB less than 140 mm Hg and is not associated with adverse effects on health or quality of life.

## Recommendation 2:

In the general population younger than 60 years, initiate pharmacologic treatment to a goal DBP of lower than 90 mm Hg.

This recommendation is based on strong evidence that initiation of antihypertensive treatment to these goals is associated with reductions in cerebrovascular events, heart failure, and overall mortality in adults aged 30 to 59 years. Considering there is a lack of sufficient quality RCT involving adults less than 30 years of age to assess the benefits of HTN treatment, the panel elected to make a recommendation based on expert opinion that the DBP threshold and goal for this population should be the same as those 30 to 59 years old.

## Recommendation 3:

In the general population younger than 60 years, initiate pharmacologic therapy to lower SBP to a goal SBP of lower than 140 mm Hg.

This recommendation is based on expert opinion due to the lack of sufficient quality RCT to assess the benefits of treatment. However, the panel noted that there was no compelling reason to change the existing guidelines and felt that since this recommendation is consistent with those for higher risk patient populations it may make implementation easier for clinicians.

## Recommendation 4:

In the population aged 18 years or older with CKD, initiate pharmacologic treatment to lower BP at SBP of 140 mm Hg or higher or DBP of 90 mm Hg or higher and treat to a goal SBP of lower than 140 mm Hg and a goal DBP of lower than 90 mm Hg.

Even though this recommendation is based on expert opinion, there is a lack of sufficient quality RCT to assess benefits in mortality, cardiovascular, and/or cerebrovascular health outcomes. Moreover, there is moderate quality evidence that progression of CKD is not slowed by antihypertensive treatment to a lower BP goal.

### **Recommendation 5:**

In the population aged 18 years or older with diabetes, initiate pharmacologic treatment to lower BP to a goal of SBP lower than 140 mm Hg and DBP of lower than 90 mm Hg.

There is moderate quality evidence that treatment to an SBP goal of lower than 150 mm Hg improves both cardiovascular and cerebrovascular health outcomes and lowers mortality. The issue of whether treatment to an SBP goal lower than 140 mm Hg compared to a higher goal in adults with hypertension and diabetes has not been addressed by any RCT. In light of this, the panel recommended the use of a consistent BP goal in the general population less than 60 years of age and in adults with diabetes of any age to aid in implementation of these guidelines.

### **Recommendation 6:**

In the general nonblack population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic, calcium channel blocker (CCB), angiotensin-converting enzyme (ACE) inhibitor, or angiotensin receptor blocker (ARB).

There is moderate quality evidence that all four of these drug classes have similar effects on overall mortality, cardiovascular, cerebrovascular, and CKD outcomes. However, in the case of heart failure, thiazide-type diuretics were superior to both CCB and ACE inhibitor for improving outcomes.

### **Recommendation 7:**

In the general black population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic or CCB.

This recommendation is supported by moderate evidence in the general black population that a thiazide-type diuretic is more effective than a CCB at improving heart failure outcomes. For other outcomes, cerebrovascular, coronary heart disease, combined cardiovascular and CKD, and overall mortality, there was no difference between these two drug classes. Use of an ACE inhibitor was associated with a higher rate of stroke in African Americans compared to use of a CCB. ACE inhibitors also have been shown to be less effective in reducing BP in this population. The evidence supporting this recommendation is weaker for African-American patients with diabetes. Outcomes for the comparison between initial antihypertensive treatment with CCB versus an ACE inhibitor in this population were not reported in any of the RCTs eligible for review by the JNC 8 panel.

### **Recommendation 8:**

In the population aged 18 years and older with CKD and hypertension, initial (or add-on) antihypertensive treatment should include an ACE inhibitor or ARB to improve kidney outcomes. This applies to all CKD patients with hypertension, regardless of race or diabetes status.

There is moderate evidence that treatment with an ACE inhibitor or an ARB improves kidney outcomes for patients with CKD. This recommendation is based predominately on kidney outcomes, as there is less evidence comparing the use of an ACE inhibitor versus an ARB regarding cardiovascular outcomes. The panel recognized that there might be potential conflict between this recommendation and the recommendation to use a thiazide-type diuretic or CCB as initial antihypertensive treatment in African Americans. To rectify this, the panel resorted to expert opinion noting that most patients with CKD and hypertension will require more than one drug to achieve goal BP. In that instance, ACE inhibitors or ARBs can be used as either initial treatment or as add-on treatment in addition to diuretic (or CCB) in black patients with CKD.

### **Recommendation 9:**

The main objective of hypertension treatment is to attain and maintain goal BP. If goal BP is not reached within a month of treatment, increase the dose of the initial drug or add a second drug from those recommended above. If goal BP cannot be reached with two drugs, add and titrate a third drug from the list provided. Do not use an ACE inhibitor and an ARB together in the same patient. If goal BP cannot be reached using the drugs recommended above because of a contraindication or the need to use more than three drugs to reach goal BP, antihypertensive drugs from other classes can be used.

This recommendation is different than the others because it was not developed with the three questions in mind that guided the evidence review. Rather, it provides additional guidance to assist in the implementation of the first eight recommendations. This last recommendation is based on expert opinion, taking into account the strategies used in RCT that demonstrated improved patient outcomes and the clinical expertise of the panel. Lastly, the panel also noted that for all patients with hypertension the potential benefit of a healthy diet, weight control, and regular exercise could not be overemphasized.

### **Take home message**

Even though these recommendations would pertain to many patients, they are not a substitute for clinical judgment. They were developed to assist clinicians in understanding what is known, and not known, about BP treatment thresholds, goals, and drug treatment strategies to achieve appropriate treatment goals based on the best available evidence.

### **About the Author**

Robert Berry, M.S., CES, RCEP, is a clinical exercise physiologist and manager of the Cardiovascular Rehabilitation and Wellness Department at Baystate Medical Center in Springfield, Massachusetts. He is also the immediate past president of the Clinical Exercise Physiology Association (CEPA).

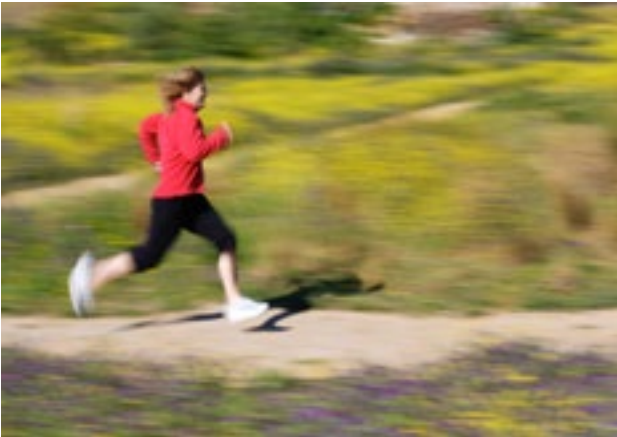


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# TRAINING CONSIDERATIONS FOR NOVICE RECREATIONAL RUNNERS

By Janet Hamilton, M.A.



Design Pics/Thinkstock

**A**lthough the word “novice” is synonymous with “beginner,” not all novice runners are created equal. There’s the true beginner, the “couch to 5K” client who is just starting to run, and then there are those who have been running for years, but are simply reaching for an event distance that is new to them.

Let us take, for example, a client who has run a 5K or two and has decided she would like to run her first 10K. What are some things to consider in designing a training plan for this athlete?

First, evaluate your client. How long has she been running? What distances has she been completing on a regular basis in training? What performance data (race distances and times) is available to project proper pacing for training? What is the athlete’s goal for this new distance—does she simply want to complete it or is she targeting a specific finish time goal? Is there any history of running-related injury?

The most important element for this novice recreational runner to achieve is the endurance needed to complete the event. For a 10K distance, achieving a weekly long-run distance of 5 to 6 miles and a total weekly mileage of about 18 to 20 will enable an athlete to complete the 10K event. In order to achieve a better performance (race it, not just complete it) she will be more successful if she works up to a long-run distance of perhaps 8 to 10 miles and a total weekly distance of 25 or more miles.

So, step one is to evaluate where the athlete is NOW (current mileage base) and determine how much she must build to achieve the desired race goal. This will help establish a reasonable timeline for training. Although there is no scientific evidence about how quickly to increase weekly mileage, the common wisdom is to avoid increasing total mileage by more than 10% per week. This phase of gradually building mileage is

often referred to as a general preparatory phase, base building, or simply conditioning. This phase lays the crucial foundation of tissue strength needed to withstand the higher intensity competition preparation phase that follows. Attempting to rush through this phase places the runner at risk for numerous injuries, such as stress fractures, tendinopathies, or other overuse syndromes.

## How long will this take?

In our example of the athlete reaching from the 5K to the 10K distance, let’s assume that her current long run is 4 miles and her total weekly mileage is 12 miles per week. The long-run distance needs to gradually increase to about 6 miles and the total weekly mileage to about 20 miles per week to be consistent with a goal of simply completing her first 10K. That means our athlete needs to increase her long-run distance by 50% and her total weekly mileage by 67%. This would require a minimum of about 6 weeks to accomplish safely. If the athlete’s goal is to race the distance (not just complete it) then she would need to roughly double her current long-run distance to at least 8 miles or more, and her total weekly mileage to 25 miles or more. A minimum of 8 weeks would be needed for this in order to not exceed the recommended mileage increase of no more than 10% per week. In addition, we cannot forget that the athlete will perform better if she has the opportunity to taper prior to her event. Thus, when planning for a 10K, include a week of time for taper prior to the race—(If you are keeping track, we are now up to a minimum guideline of 7 to 9 weeks just for base building and taper).

## What about speed-specific or high-intensity training?

If the athlete is training to race the event, including a phase of higher intensity training at faster paces will improve her chances of achieving a specific time goal. This sharpening or competition preparation phase will add at least another 3 to 5 weeks or more to the total training plan. It is prudent to transition into higher intensity workouts only after some level of physiological adaptation to the endurance phase has taken place. These physiological adaptations will depend on the athlete’s age, general condition at the start of the training cycle, distance she is training for, etc. Doing faster paced running (at race pace or faster) too early in training may result in connective tissue injuries (e.g., tendinopathy), or bone injuries, such as stress fractures.

## What about training paces and a race goal?

Since our example athlete has completed a couple of 5K races, we can take those data points and make some projections about what paces are recommended for different training runs as well as give her an estimate of her performance capabilities at the longer race distance. Numerous pace predictors exist online as

well as in print (see references below), but a couple of simple calculations will get you a ballpark estimate of what pace to recommend on most “easy” effort endurance training workouts, as well as what a reasonable race finish goal might be.

## Start with the estimation of the athlete’s potential 10K goal race time.

Multiply her 5K-finish time by 2.1 to estimate a comparable “all out” performance.<sup>1</sup> (As a novice, she will likely not achieve this in her first attempt at the distance, but it will certainly give her a perspective.)

**Example:** Let’s assume her previous 5K-finish time was 22:05.

First, we need to convert the seconds to a decimal format:

$5 / 60 = .08$  seconds

Then, multiply 5K-finish time by 2.1:  $22.08 \times 2.1 = 46.37$  minutes

And then, convert the decimals back to seconds:

$.37 \times 60 = 22$  seconds

So, a comparable all-out race effort at the 10K distance might result in a finish time of 46:22 mins.

## Calculate appropriate training paces.

To estimate appropriate training paces, multiply the athlete’s 5K race pace per mile by 1.28 to estimate an effort level that is about 78% of 5K race effort.<sup>1,3,4</sup> This should feel like an “easy aerobic effort” and should correlate with an intensity in the range of about 55% to 78% of Heart Rate Reserve (HRR).<sup>1,2</sup>

**Example:** Previous 5K finish was 22:05, meaning the average pace per mile was 7:06 min per mile.

After converting the seconds to decimal format, multiply by 1.28 to estimate training pace:  $7.1 \times 1.28 = 9.09$  min per mile.

Convert the decimal format back to seconds:  $.09 \times 60 = 5.4$  seconds, and you have your number. Your athlete’s estimated easy effort training pace is around 9:05 minutes per mile.

## The Training Plan

Setting up the weekly training schedule now becomes a matter of following the basic tenets of overload and recovery, and applying proper progressions. Remember it is during overload that the body is stimulated to make physiological adaptations, but if there are no recovery periods, then the overload will quickly exceed the body’s abilities and lead to injury. In the base building phase, since running will focus on easy aerobic paces, the novice recreational runner is “overloaded” when mileage is higher, and “recovers” when mileage is reduced. When the mileage has been built to the appropriate benchmark to achieve the race distance, then the runner can transition into the competition preparation phase and overload also can come in the form of faster paces on some (but not all) runs. Strive to keep the longest run to no more than about 33% to 38% of the runner’s total weekly mileage.

The series of sample weeks below demonstrates the basic principles of overload/recovery, mileage progression and appropriate long run distance based on total weekly miles.

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	TOTAL
Week 1	1.5	3	1.5	3	Rest	4.5	Rest	13.5
Week 2	2	3	2	3	Rest	5	Rest	15
Week 3	2	3.5	2	3.5	Rest	5.5	Rest	16.5
Week 4	2	4	2	4	Rest	6	Rest	18

Ultimately, training has to coexist with life constraints, so it is wise to be flexible in designing training plans based on each athlete’s unique time availability and personal goals. For novice recreational runners, build endurance and tissue strength first, then progress to faster paced running.

Consider all the variables and then ask yourself if your athlete has enough time to achieve her goals before her target race date. If not, it’s time to have a discussion with the client about safe progressions and potentially selecting another event date.

This short article only touches on a couple of aspects of training plan development for novice recreational runners. Whole books have been written on the topic of designing training plans for runners of various abilities, and those who wish to work with runners on a regular basis would be wise to dig deeper into the topic with the books in the suggested reading list.

## About the Author

Janet Hamilton, M.A., RCEP, CSCS, PTA, is the founder and lead coach of Running Strong Professional Coaching ([www.runningstrong.com](http://www.runningstrong.com)). She has coached more than 2,000 adult distance runners over the past 20+ years for distances from 5K to 100 miles, working with novice as well as age-group elite athletes. She served as instructor for the Road Runners Club of America coaching certification program from 2005-2012. She has contributed to articles in a variety of popular magazines, including *Runner’s World* (where she serves on the advisory board), *Running Times*, *Men’s Health*, *Self*, *Competitor*, *Women’s Running*, and others. She is an ACSM-approved provider of continuing education and offers on-demand webinars.



## Suggested Reading List

1. *Better Training for Distance Runners*, 2nd Ed.– David E. Martin, PhD, and Peter N. Coe. Human Kinetics Publishers, 1997.
2. *Daniels Running Formula*, 3rd Ed – Jack Daniels, PhD. Human Kinetics Publishers, 2014.
3. *Handbook of Sports Medicine and Science – Running*, John Hawley, Editor. Blackwell Science, 2000.
4. *The Science of Running*, Steve Magness. Origin Press, ScienceOfRunning.com, 2014.

## Online Resources

Online Pace Calculation / Prediction tools:

Daniels Calculator - <http://www.runsmartproject.com/calculator/>

McMillan Calculator - [www.mcmillanrunning.com](http://www.mcmillanrunning.com)

Runner’s World race time predictor - <http://www.runnersworld.com/tools/race-times-predictor> and training pace calculator - <http://www.runnersworld.com/tools/training-paces-calculator>



# PHYSICAL ACTIVITY MONITORS: NEW TOOLS FOR PRACTITIONERS AND THEIR CLIENTS

By Brittany S. Wilkerson, Brian C. Rider, David R. Bassett, Jr., Ph.D., FACSM



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Activity monitors are used to measure individuals' daily physical activity (PA). The traditional activity monitor, the waist-worn pedometer, allows people to track their daily step counts. Studies have shown that pedometers, along with step goals and activity logs, can be effective for motivating people to increase daily walking by slightly more than a mile. Over the years, as technology has improved, activity monitors have become more than just step counters. Current devices can monitor flights of stairs climbed, calories expended, and even quality of sleep. As the number of bells and whistles on these devices has grown, so has their popularity. Here we will highlight four of the top brands of trackers and how practitioners and their clients can use them.

The Nike+ FuelBand (\$99) is one of the newer activity monitors on the market. Its Bluetooth capabilities allow for immediate downloads to a smart phone, tablet, or computer. The wrist-worn device tracks steps, distance, sleep quality, and activity intensity as reflected by NikeFuel. Although NikeFuel is not clearly defined, the company's web site claims it to be a "universal measure of movement." The longer one exercises and the more intense the activity, the more NikeFuel an individual expends. This monitor also allows the wearer to set individual activity goals and movement reminders to keep active throughout the day. Another aspect to this monitor is the online access to the Nike+ groups to interact, challenge, and compete with friends and other FuelBand users.

The Jawbone UP (\$150), like the Nike+ FuelBand, is a wrist-worn activity monitor. This device tracks steps, distance,

calories, active versus idle time, and sleep. The Jawbone UP can be programmed to set reminders/alerts similar to the Nike+ FuelBand. This device has Bluetooth capabilities, allowing users to complete their activity profiles through a Jawbone app. The app provides the option to manually enter activities such as cycling or swimming that might not be detected otherwise. In addition, the app has a feature that allows users to track their food and drink consumption by manually adding nutrition label information, scanning barcodes of food items, or searching the database for nutritional information on foods served at popular restaurants. Jawbone has recently partnered with other activity, nutrition, and sleep apps to provide more options for consumers.

The Fitbit One (\$100) is a waist-worn activity monitor that tracks steps, distance, calories, and stairs climbed, and also allows for goal setting. The device can be attached to a wristband to monitor sleep quality. It has Bluetooth capabilities that allow wireless data uploads to the Fitbit web site. Fitbit offers two additional trackers, the Zip (\$60) and the Flex (\$100). The less expensive Zip offers fewer bells and whistles while the Flex offers everything the One does, except for an altimeter to measure flights of stairs. The Fitbit web site allows users to track their steps in 15-minute increments, log nutritional data, and manually enter additional activities (swimming, weight training, and cycling). If practitioners know their clients' usernames and passwords, they can track daily physical activity levels on the Fitbit web site.

Omron offers a number of products. Their pedometer technology has been validated for step counting in research studies. Omron's most recent device, the HJA-312 activity monitor (\$30), estimates calories expended in walking, running, and housework. This device and other Omron products can connect and upload to a central web site, Omronfitness.com. Unlike some other devices, the Omron HJA-312 does not have Bluetooth capabilities and connects to a computer through a USB docking station (sold separately for \$20). This web site allows users to track their steps, calories, and weight.

A recent article in *Medicine & Science in Sports & Exercise*,<sup>1</sup> by Lee et al. examined the validity of seven activity monitors in estimating the energy expenditure of daily activities. The authors found that of the monitors they tested, the BodyMedia FIT armband (\$400) was the most accurate, followed closely by the Fitbit Zip. The Jawbone UP and Nike+ Fuelband performed nearly as well on average, but the Nike+ was prone to greater individual errors. In addition, other sources suggest that wrist-worn devices can record extraneous wrist movements and count

them as steps. Hence, despite the trend towards wrist-worn devices, practitioners should use caution before recommending them, since their validity is not firmly established.

With many options for activity trackers, careful consideration is needed before selecting one. Things to consider when choosing a device include: 1) What variables are you most interested in tracking and does the device provide that capability? 2) Would this device interfere with your daily routines? 3) How easy is the device to use? 4) What additional resources does the device come with? A number of devices were not included in this review because they are more specific to sport or clinical applications. For instance, companies such as TomTom and Polar are traditionally known for their GPS and heart rate monitors, but have recently expanded into activity monitors with the TomTom Runner Cardio and Polar Loop.

With the variety of activity monitors on the consumer market today, knowing the differences between them is critical to selecting the right one for you and your clients. The ease of recording, uploading, and exchanging physical activity data with clients can allow you to monitor their progress and motivate them to reach their goals.

### About the Authors

Brittany S. Wilkerson is a doctoral student in the Department of Kinesiology, Recreation, and Sport Studies at the University of Tennessee, Knoxville. Additionally, she is ACSM Registered Clinical Exercise Physiologist (RCEP) and Advanced Cardiac Life Support (ACLS) certified.



Brian C. Rider is a doctoral student in the Department of Kinesiology, Recreation, and Sport Studies at the University of Tennessee, Knoxville. His academic specialization is in exercise physiology, and he is a NSCA Certified Strength and Conditioning Specialist.



David R. Bassett, Jr. is a professor in the Department of Kinesiology, Recreation, and Sport Studies at the University of Tennessee, Knoxville.



### References

1. Lee JM, Kim Y, Welk GJ. Validity of consumer-based physical activity monitors. *Medicine & Science in Sports & Exercise*. 2014;46(9):1840-8.



Applications and nominations are invited for the post of Editor-in-Chief for *ACSM's Health & Fitness Journal*<sup>®</sup>, an official bimonthly journal of the American College of Sports Medicine.

Steven J. Keteyian, Ph.D., FACSM, has served as Editor-in-Chief since 2012 and will complete his term in December 2015. The incoming Editor-in-Chief will begin duties in July 2015, and the term of office will run through the end of 2019.

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## Call for Editor-in-Chief Nominations

The Search Committee is accepting candidate applications and nominations now and plans to interview finalists in April 2015. All candidates should be members of the American College of Sports Medicine in good standing. A current curriculum vita and appropriate writing sample is required for all applications and nominations. Applicants should send a letter of interest, and nominations must have the nominee's approval. Send all materials for receipt no later than January 5, 2015 via email to: [HFJournal@acsm.org](mailto:HFJournal@acsm.org), or via mail to: American College of Sports Medicine, 401 W. Michigan Street, Indianapolis, IN 46202-3233, Attention: Lori Tish, Editorial Services Office.

Questions may be directed to Search Committee Chair **Walter R. Thompson, Ph.D., FACSM**, via email: [wrtompson@gsu.edu](mailto:wrtompson@gsu.edu) or phone: (404) 413-8365.



### Resistance Exercise (continued from page 3)

#### Strength Training Cardiac Patients

The American College of Sports Medicine recommends the following general resistance training guidelines for cardiac patients who have no evidence of congestive heart failure, uncontrolled arrhythmias, severe valvular disease, uncontrolled hypertension, or unstable symptoms.<sup>2</sup>

1. Resistance training should be performed following the aerobic activity component of the exercise session.
2. Resistance training should be performed 2 or 3 days per week with at least 48 hours between successive training sessions.
3. Each training session should include 8 to 10 exercises for the major muscle groups, with emphasis on multijoint exercises performed in a pattern of larger to smaller muscle groups.
4. Patients should begin with single-set training and progress to multiple-set protocols with the same exercise or different exercises addressing the same muscle group.
5. Patients should begin with loads that can be lifted without straining for 10 to 15 repetitions (approximately 30% to 40% of maximum resistance for upper body exercises, and approximately 50% to 60% of maximum resistance for lower body exercises).
6. Loads should be increased by approximately 5% when the end-range repetitions can be comfortably performed.

7. Low-risk patients may progress to 8 to 12 repetitions with approximately 60% to 80% of maximum resistance.
8. Patients should perform resistance exercise with proper technique, including slow movement speed, full movement range, continuous breathing, and relaxed hand grips.
9. Patients should avoid breath holding and straining and terminate exercise if they experience dizziness, arrhythmias, unusual shortness of breath, or angina discomfort.
10. Patients should train at an effort level between 11 and 14 (light to somewhat hard) on the 6 to 20 rating scale of perceived physical exertion.

More specific recommendations for resistance training cardiac patients are presented on pages 252 to 255 in *ACSM's Guidelines for Exercise Testing and Prescription*.<sup>2</sup>

#### About the Author

Wayne L. Westcott, Ph.D., teaches exercise science at Quincy College in Quincy, Massachusetts, and is an active member of the New England Chapter of the American College of Sports Medicine.



#### References

References available at [certification.acsm.org/cn-q4-2014](http://certification.acsm.org/cn-q4-2014)

### Coaching News (continued from page 4)

the brain's plasticity, improved further by the opportunity for fun social connections. Finding exercise buddies to cheer each other on can make a big difference in well-being. Eating a diet full of healthy fats, antioxidants, and lean proteins provides good brain fuel. And last for today, having a reason to live, a purpose, something that is meaningful, where they contribute in some special way, keeps seniors going even as their brains and bodies decline.

#### About the Author

Margaret Moore (Coach Meg), M.B.A., is the founder and CEO of Wellcoaches Corporation, a strategic partner of ACSM, widely recognized as setting a gold standard for professional coaches in health care and wellness. Wellcoaches has trained 8,000 health professionals as coaches in 45 countries. Moore is co-director of the Institute of Coaching at McLean Hospital, an affiliate of Harvard Medical School, and co-directs the annual Coaching in Leadership & Healthcare Conference offered by Harvard Medical School. She is a faculty member of Harvard University Extension School, teaching coaching psychology courses. She co-authored the ACSM-endorsed Lippincott, Williams & Wilkins *Coaching Psychology Manual*, the first coaching textbook in health care, and the Harvard Health Book, published by Harlequin, *Organize Your Mind, Organize Your Life*.



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