Dynamic Chiropractic

SPORTS / EXERCISE / FITNESS

# Principles of a Rehab Specialist: From Fat Loss to Performance Ready, Part 3

## HEART RATE AND EXERCISE INTENSITY

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In part 3 of this article, let's discuss heart rate and exercise intensity. It's imperative to have baseline information on your patients to determine how to most efficiently assist them in achieving their fitness goals. It's very important you know their resting heart rate and maximum heart rate (MHR). During a workout, their heart rate is a very reliable indicator of their personal performance level or training load - not as absolute numerical values, but in relation to their own heart rate values.

Calculating Maximum Heart Rate

Miller Formula: 217 - (0.85 x age)
Example: 45-year-old
(0.85 x 45 = 38.25)
217 - 38 = 189 MHR

Recent research identified the following formula as more accurately reflecting the relationship between MHR and age:[1] MHR = 206.9 - (0.67 x age).

It's relatively easy to measure your heart rate at rest by feeling your radial pulse or by using a heart rate monitor while still in bed after a good night's sleep. Once trained, our patients easily can determine their resting heart rate. However, a reliable measurement of maximum heart rate often requires a visit to a testing facility or a sports-minded chiropractor.

If you are experienced in fitness training and are enjoying good health, you also can do your own test with a maximum performance session in your favorite sport. After 15-20 minutes of warming up, do two or three maximum intensity work cycles of around 3-4 minutes and recuperate between them for 30 seconds. If it's difficult to reach high intensity in your favorite sport (e.g., cycling, cross-country skiing, rowing), you can perform the maximum intensity sessions on a steep hill. The highest measured reading you can achieve is a good estimate of your maximum heart rate.

Target Heart Rate Zone

Your target heart rate zone is the number of times per minute your heart needs to beat to achieve a desired workout effect. It's represented as a percentage of the maximum number of times your heart can beat per minute (MHR). Most research recommends working out at a target heart rate zone between 60 percent and 75 percent of your MHR.

You need to be able to progress a patient to higher levels of fitness and ensure they are sufficiently healthy to exercise at the desired intensity. Tests performed in different sports mostly indicate your maximum heart rate in that given sport, not necessarily an accurate and absolute value. For example, many people's heart rate is 10-20 beats per minute (BPM) lower when cycling than when running and even lower when swimming; while cross-country skiing often is slightly higher than

when running. When you know your resting and maximum heart rates, it's easier to control your training intensity.

Xavier Jouven, MD, did a study with men and found those whose heart rates increased the least during exercise (less than 89 BPM) were six times more likely to die of sudden death from myocardial infarction than men whose heart rates skyrocketed. More importantly, men whose heart rates didn't drop by at least 25 BPM within one minute after exercise also had a greater risk of cardiac death. The risk of sudden death from myocardial infarction was increased in subjects with a resting heart rate more than 75 BPM; an increase in heart rate during exercise of less than 89 BPM; and a decrease in heart rate less than 25 BPM, one minute after exercise.

The conclusion is that the heart-rate profile during exercise and recovery is a predictor of sudden death.[2]

How the Training Effect Works

How can we use this information to design a training session? Using the National Academy of Sports Medicine (NASM) template, we can create an "integrated performance profile." Establish the patient's current fitness level (unfit, fit, athlete, etc.) from your general and medical history, exercise history, body fat analysis and circumference measurements. Combine this information with heart rate and progress your patients to develop better results. Understand that different types of workout intensities are needed and have their own important role to play in developing your fitness level and achieving better results. We cannot let our patients do the same 30-minute walk day after day and expect progress. We have a responsibility to progress and challenge them.

Exercising below 60 percent of your maximum heart rate is relatively easy on your system. When it comes to fitness training, intensity this low is significant mainly in restorative training and improving your basic fitness when you are just beginning to exercise or after a long break. Everyday exercise - walking, climbing stairs, cycling, etc. - usually is performed within this intensity zone. These sessions, when lasting more than one hour, can develop endurance, may enhance recovery, but will not likely improve maximum performance.

Exercising at 60-70 percent of your maximum heart rate is considered the fat-burning zone. Peak fat oxidation has been shown to occur during exercise at 63 percent VO2 max. Peak fat oxidation progressively lessens above this point and was minimal at 82 percent VO2 max, which is near the lactate threshold of 87 percent.

The 60 percent to 70 percent zone improves your basic aerobic fitness level effectively. Exercising at this intensity feels easy, but workouts with a long duration can have a very high training effect. The majority of cardiovascular conditioning training should be performed within this zone. Improving this basic fitness builds a foundation for other exercise and prepares your system for more energetic activity. Long-duration workouts at this zone consume a lot of energy, especially from your body's stored fat.[3]

Exercising at 70 percent to 80 percent of your maximum heart rate begins to be quite energetic and feels like hard work. This zone will improve your ability to move quickly and economically. In this zone, lactic acid begins to form in your system, but your body still is able to completely flush it out. You should train at this intensity at most a couple of times per week, as it puts your body under a lot of stress.

Exercising at 80 percent to 90 percent of your MHR will prepare your system for competitive and high-speed events. Workouts in this zone can be performed either at constant speed or as interval

training (combinations of shorter training phases with intermittent breaks; see my previous article on interval training). High-intensity training develops your fitness level quickly and effectively, but overtraining might result if it's done too often or at too high an intensity.

Common warning signs of overtraining include:

- feeling washed-out, tired, lack of energy;
- mild, prolonged leg soreness, general aches and pains;
- pain in multiple muscles and joints;
- drop in performance;
- insomnia;
- headaches;
- decreased immunity;
- decrease in training capacity/intensity;
- moodiness and irritability;
- depression;
- loss of enthusiasm for the sport;
- decreased appetite; or
- increased incidence of injuries.

If a patient experiences these symptoms, the best prescription might be to recommend they take a break from their training program.

When your heart rate during a workout reaches 90 percent to 100 percent of the maximum, the training will feel extremely hard. Lactic acid will build up in your system much faster than can be removed, and you will be forced to stop after a few minutes. Athletes include these maximum-intensity workouts in their training program in a very controlled manner; fitness enthusiasts do not require them at all.

It's important to note that a workout with a lower perceived exertion is not worse or less significant than a workout with a high-intensity value. Both are needed in balanced training. In fact, lower-intensity workouts are most important for endurance. Low-intensity training builds a foundation on which you can safely build workouts with a higher intensity.

Understand your body's signals and how to react to them. Learn to recognize what the different heart rate zones feel like during your workouts and what kind of feelings different training effects cause in your body (sweating, ability to talk, muscle soreness). I encourage my patients to learn to notice when their heart rate differs from normal and how unusual situations (i.e., lack of sleep, stress, an oncoming flu) also affect their heart rates.

Using the NASM model as taught in the Corrective Exercise Specialist (CES) and Performance Enhancement Specialist (PES) courses, I implement an "Integrated Program Design" for my patients:

1. Train them how to perform self-myofascial release using the foam roll.
2. Train them how to perform specific stretching maneuvers.
3. Discuss how to control heart rate, performance level and exertion during exercise. Take your heart rate and know your desired heart rate limits. Decide on a training effect target for your workout that day.
4. Introduce training in the most sensible and result oriented way. This includes training programs that include core work, balance training, plyometrics, speed (straight-ahead speed), agility (lateral speed), quickness (reaction time) and resistance training.

Plan training wisely and with long-term vision. I don't want my patients to go to a personal trainer

for this type of information and intervention. I want to be able to design a training program with a personal trainer that matches my patient's needs and goals. Most of my patients want to lose weight, "get in shape," prevent osteoporosis or need to perform corrective exercises for musculoskeletal reasons. The problems I see most often in those who are working out is they have been doing the same workout without variety way too long. It's worth saying again - help patients plan long-term.

As I work more and more closely with personal trainers, I see my role as helping each of my patients with injury prevention; maintaining a regular training schedule; an upward trend in strength, endurance, balance, etc.; a correct ratio between training and rest; variety; and keeping both of us motivated.

In part 4 of this series, I will discuss functional movement tests and corrective exercise training.

*References*


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2. Jouven X, Empana JP, Schwartz PJ, et al. Heart-rate profile during exercise as a predictor of sudden death. *N Engl J Med*, 2005 May 12;352(19):1951-8.
3. Achten J, Jeukendrup A. Relation between plasma lactate concentration and fat oxidation rates over a wide range of exercise intensities. *Int J Sports Med*, January 2004;25(1):32-7.



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