Exercise: What Students Want to Know

Jamee: How much physical activity do I need in a week?
Shawna: I want to know if there’s like any easy way to motivate yourself to actually exercise.
Nels: What is good exercise and like how often you should do it. Like I’ve heard different things for actual—like lifting weights. Like some people say, "Oh, you should do like every other day," or some people might say, "Oh, you can do it multiple days in a row."
Kaitlin: If I’m interested in starting a new activity, like yoga or running, or even biking, how do I do that without spending a whole bunch of money?
Nikki: I want to know if you can get too much exercise, and if so, how much is too much?

After going through this lesson, you will be able to:

- Identify the recommended frequency, intensity, and duration of each type of fitness training;
- Define specificity; overload; repetition; and set; and
- Recognize strategies for exercising safely and effectively, gauging exercise intensity, and overcoming a fitness plateau.

The Physical Activity Guidelines for Americans, presented by the U.S. Department of Health and Human Services, are widely supported and promoted by other leading health organizations such as the American College of Sports Medicine and the American Heart Association.

They attempt to improve our nation’s health profile by getting people to sit less and move more. They are based on scientific evidence linking certain types and amounts of physical activity to improved health and reduced risk for chronic disease.

The Physical Activity Guidelines for Americans take into account the principles of exercise training: specificity and progressive overload.

Specificity refers to how the body adapts to a particular type of stress placed on it. For example, weight training promotes muscular strength, stretching promotes flexibility, and running promotes cardiorespiratory endurance. The same principle applies to sport-specific fitness and skills. For example, practicing
basketball skills improves basketball performance but not necessarily tennis or swimming performance. The most effective way to train for a particular activity is to practice that activity regularly.

However, there are benefits to **cross training**—participating in multiple types of activities across and within each of the components of fitness. For example, someone who’s training for a marathon will improve performance by cross training with some resistance training and cycling or swimming, even though running will remain the primary focus. Even if you’re not training for a specific event, cross training is beneficial because it helps prevent injury and boredom. Participating in a variety of activities can increase and maintain interest and motivation in an exercise program.

**Resources**
- Physical Activity Guidelines for Americans
- Introduction to the Physical Activity Guidelines
- American College of Sports Medicine
- The President’s Council on Physical Fitness and Sports

**The second principle of exercise training is progressive overload, which involves increasing the frequency (how often), intensity (how hard), and time (how long or duration) of an activity.**

In other words, progressive overload means making the body work harder, longer, or more often than it’s normally used to working. Overload is an important concept because, to a certain degree, as the amount and intensity of activity are increased, so are the health and fitness benefits.

Together, specificity and progressive overload are often referred to as the FITT principle, which refers to the frequency, intensity, time, and type of activity.
Cardio Recommendation

Video Transcript

Mark Pereira: At least five days of the week, try to exercise for at least 30 minutes. And this can be any form of regular physical activity, walking, jogging, cycling, swimming, tennis, racquet ball. Even housework that’s really real housework, like lots of laundry and vacuum cleaning, or gardening and so forth. That’s like the minimum, when you think about it. The more you do, the lower your risk, up to a certain point. You don’t have to be a marathoner, you don’t have to exercise vigorously for an hour, two hours, three hours per day. But the key is the moderate physical activity on a daily basis for at least 30 minutes—more is better. And you can break it up into chunks of time. You can do a 15-minute walk, twice per day. Fit it into your schedule. Walk in-between classes. Walk on your lunch break, if you’re working. Morning, night. It doesn’t matter. You just want to try to move more and sit less.

The Physical Activity Guidelines call for the equivalent of at least 150 minutes—or 2.5 hours—of moderately intense aerobic activity per week, which can be achieved in a variety of different ways.

For example, 30 minutes five days a week, or 50 minutes three days a week, meets the minimum recommendation.

Because vigorous activities make the cardiorespiratory system work harder, they provide health benefits in less time. In general, 15 minutes of vigorous activity provides the same benefit as 30 minutes of moderate activity. Thus 75 minutes of vigorous aerobic activity per week meets the minimum recommendation. This could be achieved through 25 minutes three days a week, 15 minutes five days a week, or in some other combination.

You can do all moderate activities, all vigorous activities, or some of each. As long as you’re active at a moderate or vigorous intensity for at least 10 minutes at a time, it counts toward meeting the recommendation. The goal is to achieve the equivalent of at least 2.5 hours of moderate intensity aerobic activity over a minimum of three days each week.
In order to achieve cardiorespiratory fitness sufficient for health benefits and meet the Physical Activity Guidelines for Americans, we need to engage in activities of moderate or vigorous intensity. Light activities that don’t increase heart rate don’t count toward the recommendation. This doesn’t mean they’re not also worthwhile; it just means that they aren’t sufficient in and of themselves to enhance cardiorespiratory endurance.

In general, moderate intensity activities include things like brisk walking or hiking. Playing golf counts, too, as long as you walk the course briskly and carry your clubs. Other examples of moderate intensity activities include:

- Canoeing
- Biking slowly on level ground
- Water aerobics
- Softball, volleyball, or other sports of a catch-and-throw nature
- Doubles tennis
- Ballroom dancing
- Raking leaves

Compared to activities of moderate intensity, vigorous activities are more challenging. Running, swimming laps, and playing competitive basketball are examples of vigorous intensity activities. Others include:

- Race walking or jogging
- Biking faster than 10 mph or riding up hills
- Soccer or other sports with a lot of running
- Singles tennis
- Aerobic dance or other fast dancing
- Jumping rope

Resources

What Counts as Aerobic Activity

Measuring your heart rate is a good way to gauge how hard you’re working. It can help you determine whether your physical activity is at a moderate or vigorous intensity. Exercising at a heart rate that’s 50-70% of the maximum heart rate is considered moderate intensity, whereas 70-85% of maximum heart rate is considered vigorous intensity.
You can estimate your **maximum heart rate** by subtracting your age from 220 and your **target heart rate** by multiplying your maximum heart rate by your desired intensity level. For example, if you are 20 years old, then your maximum heart rate is considered 200 beats per minute—or bpm. Your target heart rate for moderate level activity would be 100-140 bpm—200 x 50-70%. Exercising at 140-170 bpm would be considered vigorous activity—200 x 70-85%.

Using a heart rate monitor is the most accurate way to measure your actual heart rate. If you don’t have one, you can gauge your heart rate manually. Using the tips of your forefinger and middle finger—not your thumb—on either your radial artery, which is the thumb side of your wrist, or carotid artery on either side of the neck, count your pulse for 10 seconds. Multiply the number of beats by six to calculate your per-minute heart rate. If you use this method to monitor your heart rate during exercise, be sure to take your pulse within five seconds after interrupting exercise because your heart rate will start to go down once you stop moving.

Regardless of what type of activity you’re doing, it’s moderate intensity if your heart rate is 50-70% of your max and vigorous intensity if your heart rate is 70-85% of your max. For some people, brisk walking might be a moderately intense activity, but for others it might be vigorous.

Further, a person can vary his intensity level within the same activity. For example, you may be cycling at a moderate intensity of 60% of your maximum heart rate. Increasing either the bike’s resistance or your speed will cause your heart rate to increase. If your heart rate reaches 70-85% of your max, then you are exercising at a vigorous intensity.

**Resources**

[Finding Your Target Heart Rate](#)

**Another way to gauge how hard you’re working is to use a subjective scale called the Borg Rating of Perceived Exertion Scale.**

It ranges from 6 to 20, with 6 being no exertion at all and 20 being maximal exertion. Rating yourself between 12 and 14 on the scale is generally considered somewhat hard and indicative of working at a moderate intensity. A rating of 15-17 would indicate hard or very hard and therefore vigorous intensity. The key is for you to honestly rate how you feel while you’re exercising.
Another really simple way to determine whether you’re working at a moderate or vigorous intensity is to use the talk test. If you can talk—but not sing—while performing the activity, then it’s probably moderately intense. If you can’t say more than a few words without pausing for a breath, then it’s probably vigorous.

**Resources**


The Physical Activity Guidelines for Americans recommend that we perform strengthening or resistance activities that work all major muscle groups—legs, hips, back, abdomen, chest, shoulders, and arms—at least two days per week.

A full body resistance workout can be achieved in about 30 minutes. The American College of Sports Medicine recommends waiting at least 48 hours between resistance training sessions. It’s OK to strength train on consecutive days as long as you don’t train the same muscle groups two days in a row; a day of rest in between allows the muscles optimal time to repair. Resistance training can be performed on days when aerobic exercise is not, on the same day, or combined into the same workout and with or without equipment, in a gym, at home, or outside. The possibilities are practically endless!

**Dynamic resistance exercises, also known as isotonic exercises, are those resulting in a change in the length of the muscle; a biceps curl is a good example.**

The concentric contraction is the shortening of the muscle—lifting the weight—and the eccentric contraction is the lengthening of the muscle—lowering the weight. Completing both phases is considered one repetition, and multiple repetitions make up a set.

Dynamic exercises are the most popular and beneficial form of strengthening exercises; they work through a muscle’s full range of motion and can be
performed with free weights, weight machines, exercise bands, or even a person's own body weight.

Weight machines and free weights are both excellent tools for building muscular strength and endurance. You can use one or a combination of both. Deciding which to use can depend on your current skill and comfort level. **Weight machines** require less skill; they don’t require a partner for spotting and typically provide back support. They allow easy isolation of muscles and provide variable resistance throughout the muscle’s range of motion. However, their availability is typically limited to the gym. **Free weights** are widely available and take up little space. They force the user to control the weight throughout the range of motion and are truer to real-life situations. However, they require more skill and may not be as safe if not used properly. Another useful tool, **resistance bands** allow for variable resistance, are widely available, and take up little space.

Regardless of which tool you use, you will want to perform 2-4 sets of each exercise. If the training goal is primarily to build strength or mass, then the resistance should be difficult enough to reach fatigue in 8-12 repetitions, or perhaps fewer, per set. If the primary goal is muscular endurance, then it’s appropriate to do 15-20 repetitions of lighter weight. Regardless, the goal is to fatigue—or overload—the muscle. The amount of weight or resistance should be challenging, and it should be hard to lift the last one or two repetitions. If it’s too easy, then you’re not likely to see improvement in muscular strength or endurance.

**Resources:**
- Demonstrations of Muscle Strengthening Exercises
- Resistance Tubing 101
- Choosing and Using Resistance Bands

Another type of dynamic exercise is called **plyometrics**, which helps develop explosive strength useful in sports like basketball. **Plyometric exercises** typically involve jumping and quick changes in direction. They help enhance not only muscular strength and endurance, but also cardiorespiratory endurance.
Static resistance exercises, also known as isometric exercises, involve muscle contraction without a resulting change in muscle length or joint angle. They make use of an immovable object like a wall to provide resistance or involve tightening a muscle while holding still. A good example is holding a plank position. The downside compared to dynamic exercises is that strength isn’t developed throughout the muscle’s full range of motion. However, static exercises can be useful in overcoming weak points in a particular muscle’s range of motion or for maintaining or building strength following an injury when range of motion is limited.

Form is important when it comes to resistance training. Doing exercises correctly is the best way to get results and prevent injury. After all, the goal is to improve your health, not hurt yourself! We suggest that you watch the brief demonstration videos linked in the resources tab below and follow these strategies for safe, effective resistance training.

- Maintain proper body posture and alignment. If you ever get to a point where you can no longer maintain proper form during an exercise, then stop. Consider doing fewer repetitions or decreasing the amount of weight that you’re trying to lift.

- Perform exercises through the muscle’s functional range of motion. If you feel any joint pain, then stop. You may need to adjust your form, or perhaps you have limited movement in a certain joint that warrants an alternative exercise to work that particular muscle group.

- With dynamic exercises, perform both the concentric and eccentric phase in a slow, controlled manner—for example, 2-4 seconds in each direction. Not only does this prevent injury, but it helps isolate the muscle so that the muscle—not the momentum of the movement—is actually doing the work.

- Breathe throughout the set, inhaling on the eccentric phase and exhaling on the concentric phase. Holding your breath could lead to a dangerous increase in blood pressure.

- Be sure to train opposing muscle groups. For example, if you do exercises to strengthen the abdominals, also do exercises to strengthen the back muscles.
Avoid working the same muscle groups two days in a row. It’s OK to work upper body one day and lower body the next—for example, you could do shoulders, chest, upper back, and arms on Monday and Wednesday and abdominals, lower back, and legs on Tuesday and Thursday.

Resources
Demonstrations of Muscle Strengthening Exercises

If you continue to do the same exact thing every time you exercise, then you’re likely to hit a plateau, a point at which you’re no longer making improvements in your fitness level.

If your muscles, heart, and lungs are never challenged to work harder than the point to which they’ve already adapted, then they won’t further adapt. If you want to avoid or move beyond a fitness plateau, then you need to change your routine every month or so to surprise and challenge your body. For resistance training, this might mean lifting heavier weight, doing more repetitions, or changing the exercises you perform for each muscle group. For cardiorespiratory endurance activity, you could incorporate intervals of a faster pace—walking or jogging for 2 minutes, sprinting for 30 seconds, and repeating, for example. You can learn more about how to interval train in the resources tab below; it’s a highly effective and efficient form of training and great addition to an exercise program.

If you’ve been doing the same routine for a while and start to notice that you’re no longer experiencing improvement or desired changes, then you may have reached a plateau. Try doing something different, such as going to a fitness class, trying a new sport or activity, or working with a certified personal trainer; the key is to mix it up and challenge your body in new ways.

Resources
Interval training Information and Tips

Flexibility is specific to each joint and impacted by genetics and individual joint structure, which aren’t really modifiable.

Fortunately, though, flexibility is also determined by muscle elasticity and length, which can be modified through stretching to improve range of motion.
There are different types of stretching. According to the American College of Sports Medicine, static, dynamic, proprioceptive neuromuscular facilitation—or PNF—and ballistic stretches are all effective. However, different types are recommended for different situations and fitness levels. **Ballistic stretching** is recommended only for well-conditioned, high-level athletes because it involves quick, specific movements through a joint’s range of motion and even bouncing. It can be beneficial prior to competing in an event but is associated with a higher risk of injury compared to other types of stretching. **Dynamic stretching** is also generally recommended for performance athletes or otherwise conditioned people, but can be performed by individuals beginning an exercise program as long as they are careful. Similar to ballistic stretching, it involves movement through a joint’s range of motion, but at a slower and safer pace. It is generally recommended as part of a warm-up. **PNF stretching**, which involves stretching and contracting the targeted muscle, is safe for all fitness levels and recommended post-workout, as is static stretching, which may also be done pre-workout as long as the muscles are properly warmed up first. Warm muscles accept stretch better than cold muscles do, and stretching cold muscles can increase the risk of injury.

**Static stretching** involves slowly stretching a muscle to the point of feeling a slight pull or mild discomfort—but not to a point of feeling sharp pain—holding the stretch for 10-30 seconds, releasing and resting for 30-60 seconds, and repeating two to four times to an accumulation of 60 seconds per stretch, trying to stretch a bit further each time. Remember that, while it may feel a bit uncomfortable at first, it shouldn’t hurt. If it does, then you’re probably stretching too far. Continue to breathe throughout each stretch, inhaling through the nose and exhaling through the mouth or nose. Try to relax and breathe into the stretch, and avoid bouncing or forcing the stretch. Include a variety of exercises that stretch the muscles associated with all of the body’s major joints and perform each exercise on both sides of the body.

**A complete, full body stretching routine can take about 20 minutes, but even five minutes is better than nothing.**

It can be incorporated into a cardio or resistance workout, or it may be done on a day when neither cardio nor resistance exercise is performed. Regardless, the American College of Sports Medicine recommends that we perform full body
flexibility training at least 2-3 days per week, and the American Council on Exercise recommends at least 30 minutes three times per week.  Aside from these recommendations, it’s a good idea to stretch to some small degree every day. Consider doing a few stretches after taking a warm shower or bath and after sitting or standing for long periods of time. Refer to the resources tab below for stretching tips and video demonstrations.

**Resources**
- To Stretch or Not to Stretch?
- What are The Different Types of Stretching?
- Stretching Exercises Guide
- Static Stretching
- Dynamic Stretching
- PNF Stretching
- Ballistic Stretching

In addition to aerobic activity, resistance training, and flexibility training, the American College of Sports Medicine recommends that people perform 20-30 minutes of neuromotor exercise, also known as functional fitness training, two to three days per week to improve physical function and prevent falls. Such exercises involve and improve proprioception, balance, agility, coordination, gait, and muscular strength. Examples of neuromotor exercise include yoga, tai chi, and qi gong. Yoga is also great for improving flexibility, so practicing yoga two to three days each week could meet the recommendation for both flexibility training and neuromotor exercise.

**Resources**
- Neuromotor Exercise

**Community**
- Campus Rec Center Group Fitness
- Campus Yoga, Tai Chi and Pilates classes

Unfortunately, some people skip a proper warm up and cool down in the interest of saving time, but that is a bad idea. Both are important in preventing injury. Performance is enhanced as well. The warm up and cool down are just as important as the workout itself!

In general, the warm up should include a minimum of three to five minutes of low-intensity movements that are similar to those involved in the upcoming cardio or resistance phase. For example, you might walk at first and gradually build up speed to a jog or you might gently hit some forehands and backhands before a tennis match. The purpose is to gradually prepare the body for exercise.
at higher intensities by increasing blood flow and lubricating the joints that are about to be stressed. You want to slowly increase your breathing and heart rate, which helps prevent cardiovascular events due to sudden strenuous activity. If the focus of your workout is resistance training, it’s still recommended that you do a few minutes of light aerobic activity like walking or slow jogging, followed by some light resistance exercises, to warm up. For example, if you’re going to do squats with weights as part of your workout, then you might include some body weight squats as part of your warm up. Some gentle stretching is also recommended to stretch muscles and connective tissue and increase joint range of motion.

A proper cool down after a cardio or strength workout or participation in sports is important to slowly return heart rate and blood pressure to normal. It facilitates the dissipation of body heat and helps prevent dizziness and potential post-exercise cardiovascular complications, such as a heart attack. Walking and light cycling are good ways to cool down. As with the warm up, three to five minutes is typically adequate, but in general you should continue to cool down until you feel your heart rate is back down to a resting level. Even if it’s not a day that you’re focusing on flexibility training, it’s recommended to include some stretching in your cool down. Relax and stretch the muscle groups that you just worked. Performing just one set of 10 seconds for each stretch can help reduce post-exercise muscle soreness.

Some muscle soreness is normal during and after exercise, particularly when first beginning a new type of exercise, but you shouldn’t consistently be sore. If you are, then you may be working out too hard too fast, before your body is able to adjust to the increased stress. That’s why it’s important to increase the intensity and duration of your exercise program gradually. It’s also a good idea to avoid consecutive days of really hard workouts. Your muscles need a chance to recover; otherwise you risk overtraining.

Getting results from an exercise program is not just about working hard; it’s about being smart. If you ever feel dizzy, faint, or nauseated, or if you experience sharp pain or cramping, then stop and take a break. Listen to your body.
Consistent, regular training is important, but it's important not to overdo it; remember to rest and recover once in a while.

Participation in vigorous cardiorespiratory endurance exercise more than five days per week doesn’t increase health benefits and can actually increase your risk of overtraining and injury. It’s best to avoid performing vigorous aerobic activity more than five days per week. Instead, incorporate resistance or flexibility training or do a lower-intensity aerobic activity.

The body needs time to recover and repair. If you are consistently feeling tired or sore, take a break. These can be signs of overtraining, and a day off here and there is important for both physical and mental recovery. Remember to listen to your body; if you want it to perform well over the long run, then you need to take care of it.

With that said, it’s important to recognize that taking too many rest days in a row can be detrimental to your level of fitness and performance. Even just a couple weeks of not exercising can set you back quite a bit. If you work hard to get fit, then stick to it! Even if you’re just trying to maintain your current level of fitness, try to exercise at least three days per week. When you do have a particularly busy week, squeezing in just a few quick workouts can be enough. Something is better than nothing!
The Activity Pyramid, shown here, helps put all of this into perspective.

Being physically active in normal daily living lays the foundation of the pyramid. The next level is cardiorespiratory endurance activities of moderate to vigorous intensity, which should be performed 3-5 days per week. Resistance and flexibility training follow; each of these should be performed 2-3 days per week. Sedentary activities are at the top of the pyramid; these should be minimized as much as possible.

Keep in mind: while studying is a sedentary activity, it’s one that you can’t really avoid and probably don’t want to minimize as a student. Thus, in order to keep sedentary activities at the tip of your pyramid instead of the base, we suggest setting reasonable limits for optional sedentary activities such as watching television. Instead, try to be physically active during your study breaks. Go for a walk, practice yoga, or head to the gym to refresh your body and your mind. The idea is to balance a variety of healthy activities that you enjoy and that will help you get to and stay at the top of your academic game.

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