



Exercise for Health

The Secret to Living Younger Longer

Class 4: Balance and putting it all together

Thursday, November 11, 2010

1

– In the 3 previous classes, we've laid the foundation for exercise (the what and why), discussed 3 of the 4 basic components (cardio, flexibility, strength), and today we come to the end of the series.

What we'll cover

- * **Balance**
- * **Exercising with various health conditions**
 - * **Disease (e.g. cancer, cardiovascular disease, diabetes)**
 - * **Arthritis**
 - * **Overweight/obesity**
 - * **Osteoporosis**
- * **Putting it all together and making it happen -- strategies for success**

– We'll look at the final and extremely important component, balance, and we'll look at how exercise should be approached in light of some common health conditions. We'll also discuss how you can make all this info work for you. We'll create an exercise program, along with some sample training programs.

Balance & Fall Prevention



It ain't easy!

- Today we'll look at the last of the major components of exercise: balance.
- Let's begin by seeing how good your balance is. Please stand up. Arms at sides, lift one foot about 6 inches off floor and hold 30 sec. If that's easy, close eyes. Did you feel a little wobbly -- more than 5, 10, or 20 years ago? If so, right in norm...balance tends to erode with time. The problem with poor balance is it leads to falls.

We all fall



Thursday, November 11, 2010

4

– Falling is a universal experience, and when you're young, it's no big deal. You fall all the time when you first learn to walk or ride a bike. But soon you find your balance, and you then take it for granted. But when you start to age you often don't feel as steady. You simply don't move as much and in as many directions as when you're young so you don't use your balancing skills...and if you don't use them, you may lose them. Practicing balance is important for anyone, but particularly for older adults. Poor balance is a major cause of falls, and as your joints stiffen, your bones become more brittle, falling can result in serious injury. Every year, more than 1/3 of people over 65 and half of those over 75 fall. And falls account for the highest number of accidental injury deaths in adults 65 years and older.

What is balance?

- * **The process by which we control the body's center of mass with respect to the base of support**
- * **Balance control components**
 - * **Visual**
 - * **Vestibular**
 - * **Somatosensory**



Thursday, November 11, 2010

5

- When standing, base of support is whatever you have on the ground -- one foot, two feet or two feet and a cane.
- Complex interaction of several of body's systems
- Visual tells us where we are in relation to the world and where we're going
- Vestibular, the inner ear balance center: 3 fluid-filled semicircular canals and two other chambers that are sensitive to movements of the head and relay its position to the brain
- Somatosensory: sensory input from feet as well as muscles and tendons

What can affect balance?

- * **Neurological conditions (e.g. stroke, Parkinsons)**
- * **Diabetes**
- * **Arthritis**
- * **Vision problems**
- * **Inner ear changes**
- * **Stiffening of connective tissue**
- * **Decline in physical activity and decreased muscle strength**
- * **Prolonged reaction times**
- * **Joint injury or surgery**
- * **Medications**

– These are some of the major conditions that often accompany aging that can affect balance.

Improving balance

- * **Address physical impairments**
- * **Look at your medications**
- * **Stay fit -- the best way to improve balance**
- * **Improve posture and strength**
- * **Participate in a balance training program**

Components of a good balance program

- * Addresses moving body's center of gravity
- * Multi-sensory
- * Addresses postural stability
- * Addresses gait
- * Improves strength and flexibility



Thursday, November 11, 2010

8

- While simply moving is helpful in maintaining balance, focusing on challenging the body's balance components will help stimulate the brain's balance neurons.
- These are some of the components of a dedicated balance program
- You can say the body's center of gravity is located at the belly button. Where it goes, the body's center of mass goes. And we said controlling that center of mass is balance. Stand up again and try to stand on one leg. Notice what your body automatically did? Shifted weight to stance leg. Try to do it without shifting weight.
- Multi sensory is challenging all 3 of the body's balance components by removing one or more components and requiring the remaining to do all the work.
- Postural stability is practicing perturbations and recovering from them
- Gait works on walking with various bases of support and in different directions
- Building strength and flexibility is critical -- can't move confidently without strength and certainly can't get up off the floor if you've fallen

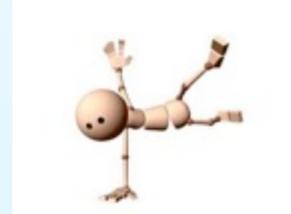
Balance exercises

- * **Center of gravity:**
 - * **Weight shifts on ball and standing: practice very slow stepping**
 - * **Altered base of support (ABOS): practice tandem and 1-leg standing**
- * **Multi-sensory**
 - * **Practice ABOS with eyes closed**
 - * **Stand on a pillow and toss a ball**
- * **Postural stability**
 - * **Voluntarily lose balance to the point you must step to regain it (front, side, and back)**
- * **Gait**
 - * **Practice walking with narrow and wide stances and tandem walking**
 - * **Walk backwards**
- * **Forever balance exercises**



Major Exercise Components

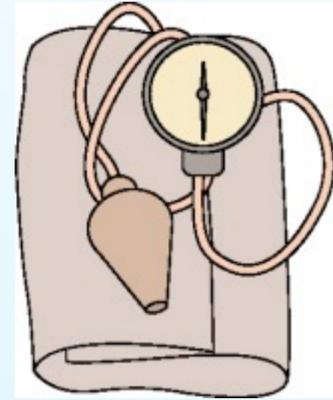
- * **Aerobic**
- * **Strength**
- * **Flexibility**
- * **Balance**



– So now we've completed them all. But how do you safely exercise and include all these components if you have a medical condition. That's what we want to discuss now. Then we'll put all this together so it makes sense for you.

Exercise & Medical Conditions

- * Physical activity is almost always an option, no matter the condition
- * Dept of Health and Human Services "2008 Physical Activity Guidelines for Americans" emphasizes that people with chronic medical conditions and disabilities should get as much exercise as other adults
- * A condition may affect people differently
- * Important to see your doctor
- * Key points to remember
 - * Start slowly
 - * Warm up
 - * Cool down
 - * Have fun!



– Different effects: one person may benefit from aerobic exercise, another from strength training. Also, different conditions impose different limitations.

– Doctor: Can tell you if any activity is dangerous for you. May help determine level of intensity, frequency, duration. Ask how meds will affect your exercise.

– Key points: Begin at comfortable pace and gradually increase duration by adding couple of minutes each week. Warm up: Especially important. Warm up slowly by starting your activity at very low intensity. Gradually increase intensity until at target level for the day. Cool down: Light activity and flexibility exercises. Prevent muscles from becoming too sore and get HR back to normal. Fun: Choose activity you enjoy -- much more likely to continue

Cardiovascular disease

- * **Regular exercise can help prevent a heart attack or help reduce risk of a second one**
- * **Any aerobic activity likely to be beneficial**
- * **Goal: maintain or gradually increase strength and endurance of your heart and other muscles**
- * **Intensity: light to moderate, especially at first**

- Helps prevent by reducing pressure on damaged arteries and reducing buildup of plaque. Can reduce LDL and increase HDL. Also helps combat other risk factors for coronary artery disease such as obesity and high BP.
- Moderate walking on level surface or riding stationary bike w/low resistance may be only exercise you need at first. Warm-ups and cool-downs should be at least 10 min. Never exercise to the point of chest pain, labored breathing or extreme fatigue.

Cancer

- * Numerous studies show regular physical activity and exercise can produce variety of benefits for those with cancer
 - * Better control of side effects
 - * Maintenance of muscle tone and stamina
 - * Reduced stress, improved health, and possibly even improved survival
- * Because cancer treatment often affects whole body, activities that work entire body, such as swimming or walking, are especially recommended
- * Precautions needed depend on specific condition, so talk to your doctor

Diabetes

- * **Regular exercise can help control blood sugar levels, manage weight, and improve cardiovascular health**
- * **Guidelines**
 - * **Try to exercise at least 30 minutes/day most days of week**
 - * **Most recommended: low- to moderate-intensity aerobic activities such as walking, bicycling, swimming and rowing**
 - * **Try to maintain a fairly steady intensity throughout each session to avoid altering your blood sugar levels**
 - * **Engage in general strength training program to increase muscle mass and insulin sensitivity**
 - * **Check blood sugar before, during and after exercising. Range should be between 100 mg/dL and 250 mg/dL**
 - * **Drink plenty of fluids**

- In type 2 diabetes, exercise can help lower blood sugar levels by tapping into your blood's sugar supplies for energy and increasing efficient use of insulin. Some are able to manage their type 2 with diet and exercise alone. In type 1, exercise alone can't normalize blood sugar levels, but it can increase your sensitivity to insulin and may reduce amount of medication you need
- Exercise contributes to weight loss, which also increases body's sensitivity to insulin, regardless of type. Can also help prevent some of cardiovascular complications of diabetes, such as high BP and cardiovascular disease.
- Range: DON'T exercise if numbers outside this range
- Also, take good care of your feet -- avoid blisters and keep feet dry
- Also, good idea to wear medical ID bracelet that lets others know you have diabetes

Arthritis



- * **Exercise very effective in reducing pain**
- * **Need to move joints and strengthen muscles to keep joints functioning their best**
- * **Flexibility and ROM exercises, strength training, and aerobic conditioning are all recommended**
- * **Main precaution: protect your joints from further damage, so go low-impact**
- * **Main guide: if you feel pain for more than two hours after your workout, you need to cut back**
- * **Cross-training (alternating between a variety of exercises) helps prevent overworking a particular set of muscles or joints**

- A 2008 report in the Cochrane Database of Systematic Reviews looked at 32 studies of people with knee OA. Exercise as effective as non-steroidal anti-inflammatory drugs such as Aleve or Advil. Another review of 8 trials that studied the effect of exercise on pain in hip OA, published in the Apr 2009 issue of Evidence Based Medicine, found that exercise reduced patient's experience of pain by almost 50%.
- Flex and ROM: can help reduce pain and stiffness and increase mobility. Gentle forms of yoga and tai chi are examples; strengthening the muscles around your joints helps take pressure off your cartilage and bones; aerobics can strengthen muscles as well as improve joint stability and increase endurance/overall fitness.
- Low impact: cycling, swimming, cross-country skiing. Don't overdo. Swimming/water exercises reduce stress on joints. Also provides form of strength training

Overweight/obesity



- * **Physical activity must be combined with dietary modifications**
- * **First goal: simply increase daily activity**
- * **Foundation of exercise program is aerobic conditioning**
- * **To reduce stress on joints caused by excess weight, go for low-impact aerobic activities such as walking, cycling, elliptical machine. If feet or joints hurt when standing, try non-weight-bearing activities such as water activities, cycling.**

- When you look at the Biggest Loser, exercise seems to get the most attention. But if you have a lot of weight to lose, exercise alone simply won't get the job done. You've got to cut out 3,500 calories to lose just one pound. The best way to do this is to combine exercise with diet mods. For example, if you burn 250 calories/day exercising and consume 250 less calories a day eating, you'll cut 500 calories a day. This would result in loss of 1 pound/week. You'll probably want to lose more, so unless you can spend hours a day in the gym, you'll need to cut back more on calories eaten.
- Exercise is extra difficult if you're very overweight. Simple movements such as bending over may be difficult, and you may not be able to stay on your feet very long. Many overweight people avoid exercise because it hurts, they're out of shape, they're embarrassed. So overcoming such obstacles are difficult but so worth it. First goal is to simply get moving, even just a few minutes a day. Things like: walking around living room a few times each day; taking 2-3 min walking breaks at work a few times each day; parking farther from destination and walking; putting away the TV remote and getting up to change channel; marching in place during TV commercials or while talking on phone; walking dog; climbing stairs; gardening; housecleaning. Start slowly. Warm up for any activity (shrug shoulders, tap toes, swing arms, march in place), cool down, stretch
- While strength training is still important, the centerpiece of your exercise program will be the aerobics. That's because you can maintain the activity for longer time and burn more calories. Start trying to walk 5 minutes at least 3 days a week. Aim for 30 minutes most days of week. Then, working up to 60 minutes a day will bring most benefits. Shorter sessions of 10-15 min. are OK

Osteoporosis

- * Regular exercise great for bones and muscles
- * Three types of activities often recommended:
 - * Strength training (especially exercises for the back)
 - * Focus on exercises that gently arch back and ones that focus on muscles between shoulder blades (rows, prone cobras, core exercises)
 - * Weight-bearing aerobic activities
 - * Exercises on your feet that work directly on the bones in legs, hips and lower spine (e.g. walking, dancing, low-impact aerobics, gardening)
 - * Flexibility exercises
 - * Having full ROM around joint helps prevent muscle injury
 - * Helps improve posture
- * **AVOID:** high impact exercises; jerky, rapid movements; bending (flexing your spine) and twisting forward at the waist

- Exercise helps maintain, and even increase, bone density. Also strengthens muscles and improves overall fitness. Together, strong bones and muscles will improve posture and balance, which can reduce risk of falls.
- Avoid high-impact exercises such as jumping, running or jogging -- these produce added compression in your spine and lower extremities and can lead to fractures in weakened bones. Avoid jerky, rapid movements in general. Also avoid bending and twisting, including touching your toes, doing sit-ups and using a rowing machine. These also have a high compressive effect on the bones in spine. If severe osteoporosis, avoid golf, tennis and bowling -- may require bending or twisting forcefully at waist. HOWEVER, if you have only mild bone deterioration and don't have osteoporosis, these exercises may be beneficial

Exercise prescriptions for common conditions

	Mode of exercise	Intensity	Duration	Frequency
Cardiovascular Disease	Aerobic and strength training	Moderate	30 to 60 min	3 or more days/week
Arthritis	Flexibility, aerobic and strength training	Low to moderate	30 to 60 min	3 or more days a week
Osteoporosis	Weight-bearing, flexibility, aerobic and strength training	Moderate	30 to 60 min	Strength: up to 3 days a week Weight-bearing: most days
Diabetes	Aerobic and strength training	Low to moderate	30 to 60 min	Most days of week
Overweight/obesity	Aerobic and strength training	Low to moderate	60 min	5 to 6 days a week

Coming up with a plan

- * **There's no one size fits all; everybody is unique**
- * **Where to start:**
 - * **Set goals and determine which exercises will help you meet them**
 - * **Recognize your limitations...the exercises you can't do**
 - * **Establish your workout space and time**
 - * **Decide what equipment you need**
 - * **Track your progress**
 - * **Enjoy yourself**
 - * **Add variety**
 - * **Stay motivated and overcome barriers**
 - * **Reward yourself**



– OK. You're convinced you need to begin a fitness program. So where do you start?? How can we package all this information into something that you can take home and use?

– First, remember you are unique. No one has the same set of body and medical characteristics that you do. Some of what you do will have to be trial and error until you find what really works for you. What experts can tell you is what medical research and studies have shown to generally be the case -- what seems to work for most people. But we've all heard of people who smoke 2 packs of cigarettes a day and live to over 100. Or they eat fast food all the time and live a long time. Often you can lay this to genes. There are 3 types of genetic combinations (genes from your mother and father): 1 combination, very rare, will predispose you to disease no matter how good you are; another, also rare, will predispose you to health no matter how bad you are, and third (vast majority of us) predisposes you to neither -- lifestyle will make a huge difference. Up to age 75, genes will account for around 30% of your health, 70% is lifestyle; after age 80, 100% is based on lifestyle. My Dad will be 101 in January, and he has never eaten what would be called a nutritious diet. His favorite food is a Big Mac. But he has been active all his life (mostly walking), and he is very light. So he's avoided any conditions related to overweight or a sedentary lifestyle. He just now is having to deal with a heart condition (atrial fibrillation), which for the first time is really slowing him down. So any exercise program must be designed around you: your goals, health, medical conditions, past experience with exercise, motivation.

– So let's look at where to start. Set your goals based on how much exercise you need and an assessment of your current readiness for exercise. First, understand the difference between physical activity and exercise. Physical activity is any movement you make that burns calories (gardening, golfing, playing with your grandkids, housework). Exercise is planned, structured and repetitive physical activity that you do to improve fitness. (lifting weights at the gym, taking brisk 30-minute walks each morning, swimming laps) Physical activity, as long as it's at least moderate, can count toward the 30-60 minutes required most days of the week. But to be sure you get the recommended amount of physical activity into your schedule, it's best to establish a structured exercise program. Also keep in mind that the recommendations of experts are very general in nature and they pertain primarily to

Sample walking program



Week	Warm-up Time	Brisk Walk Time	Cool-Down Time	Total Time
1	Walk slowly 5 min	Walk briskly 5 min	Walk slowly 5 min	15
2	Walk slowly 5 min	Walk briskly 8 min	Walk slowly 5 min	18
3	Walk slowly 5 min	Walk briskly 11 min	Walk slowly 5 min	21
4	Walk slowly 5 min	Walk briskly 14 min	Walk slowly 5 min	24
5	Walk slowly 5 min	Walk briskly 17 min	Walk slowly 5 min	27
6	Walk slowly 5 min	Walk briskly 20 min	Walk slowly 5 min	30
7	Walk slowly 5 min	Walk briskly 23 min	Walk slowly 5 min	33
8	Walk slowly 5 min	Walk briskly 26 min	Walk slowly 5 min	36
9	Walk slowly 5 min	Walk briskly 29 min	Walk slowly 5 min	39
10	Walk slowly 5 min	Walk briskly 33 min	Walk slowly 5 min	43
11	Walk slowly 5 min	Walk briskly 37 min	Walk slowly 5 min	47
12	Walk slowly 5 min	Walk briskly 42 min	Walk slowly 5 min	52
13	Walk slowly 5 min	Walk briskly 47 min	Walk slowly 5 min	57
14	Walk slowly 5 min	Walk briskly 53 min	Walk slowly 5 min	63
15	Walk slowly 5 min	Walk briskly 60 min	Walk slowly 5 min	70

- Walking is an excellent relatively low-impact exercise; simple, inexpensive, requires no equipment other than good pair of shoes (important!)
- This program starts you out slowly and gradually increases the duration. This type of program would be especially good for weight loss. Walking briskly means you feel somewhere between “warm and slightly out of breath” to “out of breath and sweaty”.
- Crank up the intensity, in addition to walking more briskly, by walking hills. But begin on a level surface.

Sample Strength Training Program

Muscle Group	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Chest	Off	Chest presses or push-ups	Off	Chest presses or push-ups	Off	Off	Off
Shoulders	Off	Dumbbell presses or side laterals	Off	Dumbbell presses or side laterals	Off	Off	Off
Back	Off	Lat pull-downs, rows or prone cobras	Off	Lat pull-downs, rows or prone cobras	Off	Off	Off
Biceps	Off	Curls	Off	Curls	Off	Off	Off
Triceps	Off	Triceps extensions or kickbacks	Off	Triceps extensions or kickbacks	Off	Off	Off
Quadriceps	Off	Leg presses, lunges or squats	Off	Leg presses, lunges or squats	Off	Off	Off
Hamstrings	Off	Leg curls	Off	Leg curls	Off	Off	Off
Glutes	Off	Bridge	Off	Bridge	Off	Off	Off
Abductors/Adductors	Off	Hip abduction/adduction	Off	Hip abduction/adduction	Off	Off	Off
Core	Off	Crunches, Side bridge, Standing cable rotation	Off	Crunches, Side bridge, Standing cable rotation	Off	Front Plank or other core stability	Off

-This is an example of a total body workout on 2 days a week. If you want to do strength training 3 days a week (a good thing!), you could do the same workout on Saturday or Sunday. Keep in mind that the body will hit a plateau if you do the same thing forever -- it adapts to whatever challenge you give it. So you need to change your program from time to time to keep making progress (or even to maintain). You might want to get with a personal trainer for recommendations.

Sample Strength Training Program

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Shoulders	Off	Dumbbell presses or side laterals	Off	Dumbbell presses or side laterals	Off	Off	Off
Back	Off	Lat pull-downs, rows or prone cobras	Off	Lat pull-downs, rows or prone cobras	Off	Off	Off
Biceps	Off	Curls	Off	Curls	Off	Off	Off
Triceps	Off	Triceps extensions or kickbacks	Off	Triceps extensions or kickbacks	Off	Off	Off
Quadriceps	Off	Off	Leg presses, lunges or squats	Off	Leg presses, lunges or squats	Off	Off
Hamstrings	Off	Off	Leg curls	Off	Leg curls	Off	Off
Glutes	Off	Off	Bridge	Off	Bridge	Off	Off
Abductors/ Adductors	Off	Off	Hip abduction/ adduction	Off	Hip abduction/ adduction	Off	Off
Core	Off	Crunches, Side bridge, Standing cable rotation	Front Plank	Crunches, Side bridge, Standing cable rotation	Front Plank	Off	Off

-Example of splitting workout: upper body Tues and Thurs; lower body Wed and Fri. This works well if you don't want to spend as much time on strength one day and would rather spread the workout to the next day.

Sample Exercise Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday rest
Balance	Balance exercises before walking, 10 min		Tai chi class, 30 min		Balance exercises before walking, 10 min		Use as a recovery day, or engage in light physical activities such as gardening, walking dog
Flexibility	Stretch after walking, 10 min	Stretch after strength training, 10 min	Stretch after walking, 10 min	Stretch after strength training, 10 min	Stretch after walking, 10 min		
Strength training and core stability		Strength training (total body), 30-40 min		Strength training (total body), 30-40 min		Core stability exercises, 15 min	
Aerobic	Walk, 30-40 min	Walk, 20 min	Walk, 30 min	Walk, 20 min	Walk, 30-40 min	Water aerobics class, 45 min	

- This is an example of a program that includes all 4 components of exercise and takes 60 minutes/6 days a week. While optimum, you may not have this much time. Assess your goals and what is most important to you and then cut back the time on the activities not as critical. For example, if you're trying to lose weight, don't cut back the aerobic time. Choose to perhaps reduce the balance time to 5 min and stretching to 5 on Monday and reduce the strength to 20-30 min on Tues. But try to make exercise a top priority, discover the difference it can make in your life, and make time for it.

Bottom line

- * **Use it or lose it!**
- * **Consistency is the key!**
- * **Enjoy it!**



REMEMBER

There are 1,440 minutes in a day.

Take 30 of them to exercise.

