

PEP305
Handout
Materials
Part II

Interval Circuit Resistance Exercises

1. Tricep with squat (off step)
2. Bicep with squat (off step)
3. Rows (off step)
4. Single arm cross-overs (1 ft on step)
5. Lat/Posterior deltoid (1 ft on step;
front ft on exertube; stationary lunge)
6. Anterior deltoid/pectorals (1 ft on step
back ft on exertube)
7. Squat with lateral raises

Step and Tube Workout Exercises

V step on both sides

1. Tricep with squat (off step)
Step: Alternating basic & turn step
2. Bicep with squat (off step)
Step: Alternating knee and repeater
3. Rows (off step)
Step: T-Step
4. Single arm cross-overs (1 ft on step)
Step: Tap and over the top
5. Anterior deltoid / pectorals (1 ft on step
back ft on exertube)
Step: Turn step and abduction turn
6. Squat with lateral raises
Step: Charleston step

Step and Ball Workout Exercises

1. Step: Alternating basic & turn step:
Ball: 5 laps
2. Step: Alternating knee and repeater
Ball: 5 laps
3. Step: T-Step
Ball: 5 laps
4. Step: Tap and over the top
Ball: 5 laps
5. Step: Turn step and abduction turn
Ball: 5 laps
6. Step: Charleston step
Ball: 5 laps

Different Exercises Clinic

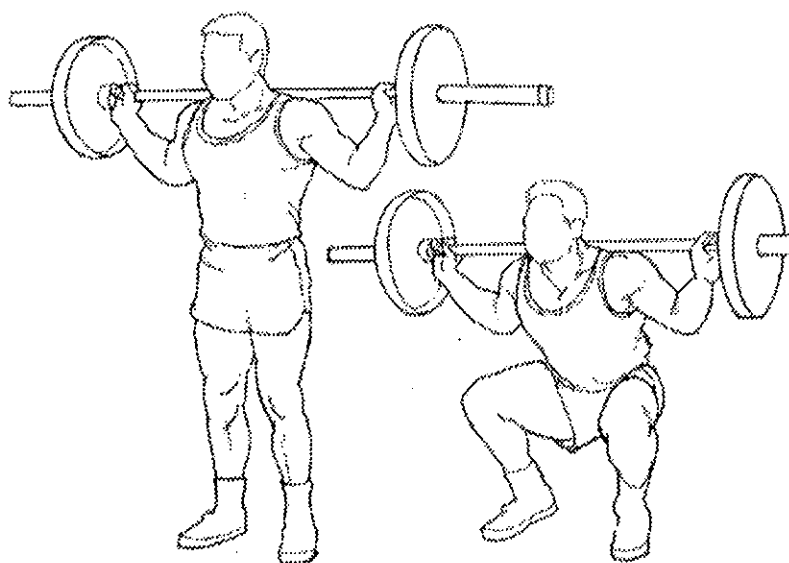
1. Stability Ball Flye (with dumbbells)
 - a. Single arm version (palms starting facing in)
2. Dead lift (modified) on Platform with Medicine Ball
 - a. Focus on core activation and movement control
3. Total Body Function Exercise (with dumbbells)
 - a. Semi-straight dead lift
 - b. Supinate forearms and do bicep curl
 - c. Pronate forearms and do shoulder press
 - d. Lower slowly to start
4. Gluteal/Hamstring Bridges with Stability Ball
 - a. Double leg is usually plenty for most people: single leg is very challenging
5. Russian Twist on Stability Ball
 - a. Slow and controlled actions—go for greater range of motion
6. Traveling Push-up With Medicine Ball and Dumbbell
 - a. Half or full push-ups
7. Back Extension with Row on Stability Ball
 - a. Focus on back extension into the row
8. Medicine Ball Squats (single leg on bench)
 - a. Emphasize balance, stability, function
 - b. Facing forward and from side
9. YOU CREATE! Dumbbell Routine of 3-6 moves
 - a. Emphasize balance, stability and function

Performing the Squat

Primary movers: gluteus, hamstrings, quadriceps

Joint Motion: hip extension, knee extension

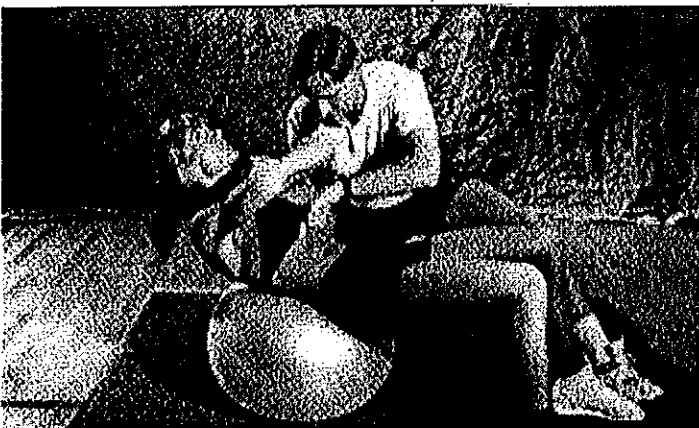
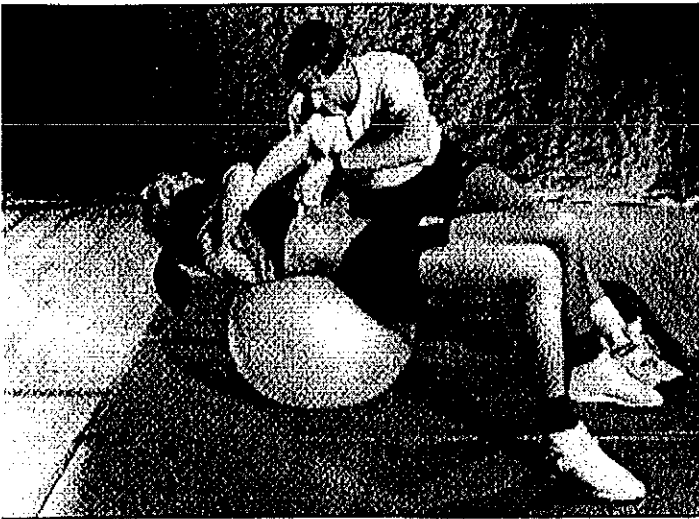
1. Stand with feet shoulder width apart
2. Toes forward or slightly turned out (no more than 35 degrees)
3. Keep the back in its normal lumbar position (tighten the abdominals)
4. Keep head up with eyes looking forward
5. Sit back with the buttocks and simultaneously lean slightly forward with the torso
6. Descend and ascend with a slow, even tempo
Keep your weight over you ankles
Keep your knees aligned over your feet
7. Descent for most people until there is approximately 90 degree angle between the upper and lower leg. There is little evidence that going lower enhances the physiological benefits
8. Breathing: inhale going down and exhale coming up (do not hold breath during upward phase: this is called the Valsalva maneuver, which significantly increased intrathoracic pressure)



Physioball Crunch

Primary movers: Rectus abdominals, internal and external obliques
Joint Motion: spinal flexion

1. Lie on fit ball with back slightly extended
2. Flex knees to form a 90 degree angle between upper and lower leg
3. Begin with arms crossed over the chest
4. Contract abdominals and bring rib cage towards pelvis
5. Keep the head and neck in a neutral posture
6. Avoid too much back hyperextension



Stability Ball Workout: Abdominals, Back and Core

Len Kravitz, Ph.D.

- I. Warm-up class with traditional warm-up
- II. Familiarization exercises with stability ball
 - A. Standing with ball stretched over head: Alternate lunge (fr/side) & tap ball in front
 - B. Standing straddle, reach and extend: roll ball out and in with torso stretch
 - C. Stationary lunge hold: roll ball slightly out in and in (both sides) [add deep lunge]
 - D. Stationary lunge motion: use ball for balance (both sides)
 - E. Stand with ball in front (hands on ball): leg/hip extension alternating legs
- III. Abdominals, Back and Core Workout on Stability Ball (encourage bracing throughout)
 - A. Sit on ball: bracing exercises; single (& double) arm elbow pull down; chest squeeze
 - B. Neutral spine exercise (forward and backward) finding 'neutral'
 - C. Rotation on ball with core engaged
 - D. Sitting on ball: walk out and walk back; place hands on ball for extra stability
 - E. Basic crunch: arm variations for variety and difficulty (review correct technique)
 - F. Crunch rotation variations: teach holding on to ball initially
 - G. Bridge (bent leg) position: full back on ball; emphasize hold (hands on thighs)
 - H. Bridge (straight leg) position: add opposite arm variations for core challenge
 - I. Bridge: go back and forth from bent leg to straight leg position
 - J. Bridge: (bent and straight leg) lifting one leg (vary arm positions)
 - K. Prone: Pushup HOLD with ball in front: Walking BACK and in with legs (as this is much safer), emphasize time holding
 - L. Forearms on ball-PLANK (on knees): walk legs back for safety; little circle, spell name (fr/bk)
 - M. Prone (hips on ball): walk out to knees, push-up position and hold (walk back)
 - N. Prone (hips on ball): Jackknife exercise (knees on ball)
 - O. Prone (hips on ball): Jackknife exercise to one side and the to other side (knees on ball)
 - P. Prone (hips on ball): Feet touching or OFF floor; leg hip extension alternating legs
 - Q. Prone (hips on ball): Quadriplex
 - R. Prone: Jackknife exercise lifting one leg (advanced students only)
 - S. Side lying on ball: lift arm and lift leg and balance
 - T. Supine lying on floor, heels on ball: grasp ball with legs and crunch
 - U. Supine lying on floor, heels on ball: grasp ball with legs and reverse crunch
 - V. Supine lying on floor, arms holding ball: crunch variations (and bug exercise)

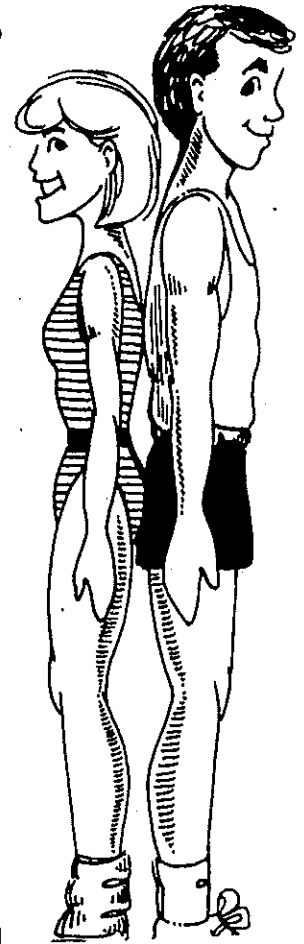
Teaching Group-led Exercise

Some Common Aerobic Fitness Movements

1. **March/jog/run:** arm variations, traveling directions (2 corner, 4 corner, 4 wall)
2. **Step touch:** to side, to front with heel, arm variations
3. **Step knee lifts:** in front, to side, different heights, with arm variations, with repeats on one side
4. **Step kicks:** in front, to side, different heights, with arm variations, with repeats on one side
5. **Grapevines:** arm variations
6. **Staddle stand combinations:** legs open wide, with arm variations
7. **Power strides:** arm variations, direction changes, different intensities
8. **Charleston steps:** different intensities
9. **Pendulum leg swings:** side, arm variations
10. **Lunge combinations:** low impact and high impact, arm variations, with repeats on one side
11. **Jumping jack combinations:** low impact styles, arm variations, repeat combinations, with leg kicks (or knee lifts)

Guide to a Better Back

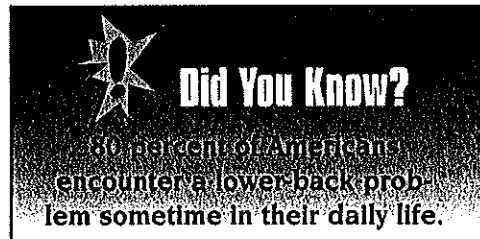
It's a pain! Why do you get this lower-back pain and what can you do to prevent back problems? Although there may be a number of different contributing factors to lower-back pain, it's essential to realize that when you stand upright, most of your body weight falls on the lower back. Weak abdominal and back muscles from underuse and/or poor posture may not give the spine the support it needs, leaving the back prone to pain or injury. Your goal to a healthy back is to keep the muscles of the spine, buttocks, and upper legs strong and flexible, be aware of preferred posture, and control your weight.



Healthy Back Tips

Standing and Walking

Maintain your normal back curve, but avoid the swayback posture. Stand tall, feeling lifted throughout the lower abdominal region. Try not to stand still too long. If you must, put one leg up on a support or at least bend alternate knees. Limit your high heel wearing time because these shoes accentuate the back curve and create stress on the spine. Use your abdominal muscles to support your body weight as you stand or move.



Lifting

Bend your knees, not your back, when lifting. Hold objects close to your body and avoid over-the-head lifts. Avoid rotating your body when lifting or lowering an object. Instead, change your foot placement while maintaining the object directly in front of you.

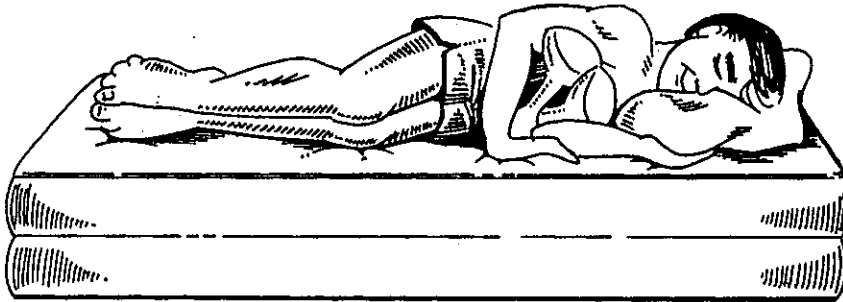
Sitting at Your Computer Station

Sit in an adjustable chair that keeps your back upright or slightly forward. The adaptable backrest should maintain your body's natural lower back curve. Your knees should be slightly lower than your hips. Your feet should be firmly placed on the floor or a footrest. Your keyboard should be at elbow level, with the bend at your elbows near 90 degrees. Your hands and wrists should be straight and relaxed. For some people, wrist rests are preferable. Your eyes should be approximately at a midscreen height of your monitor with your head about an arm's length from the screen.



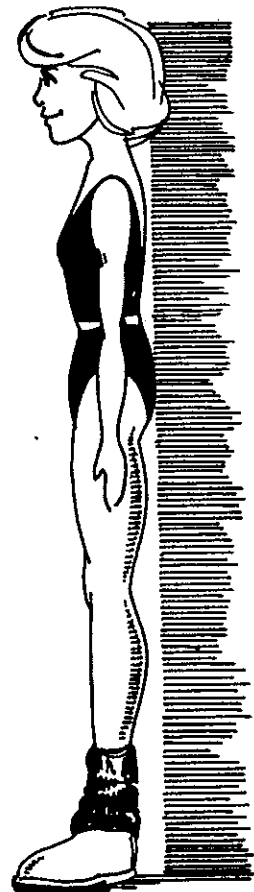
Sleeping

Try sleeping on your side on a firm mattress with your knees slightly bent or on your back with a pillow under your knees. If you must sleep on your stomach, place a small pillow under your abdominals to correct for a sagging spine.



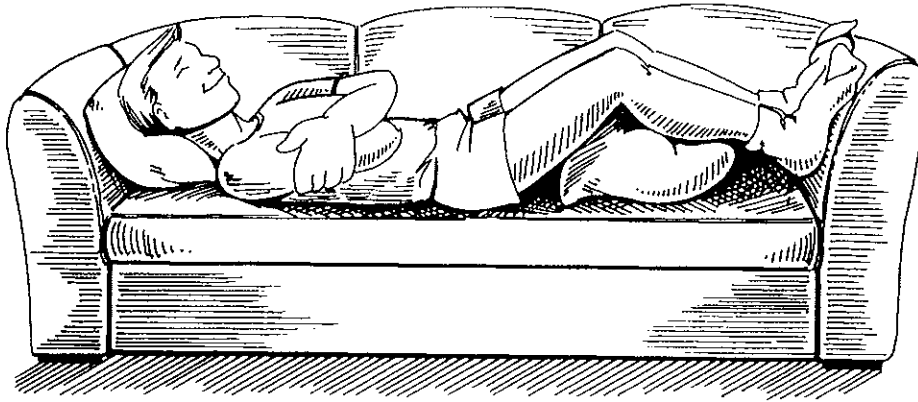
Test Your Posture

With correct posture, you maintain the normal curve in the lower back. Test your posture by standing with your hips, back, and head against the wall. Your heels should be a couple of inches away. There should be only minimal space between your lower back and the wall. You should be standing tall with a long neck and eyes straight forward.



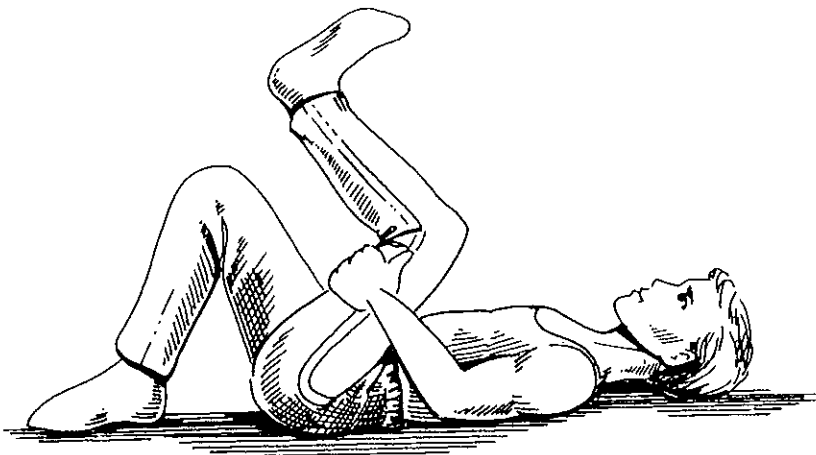
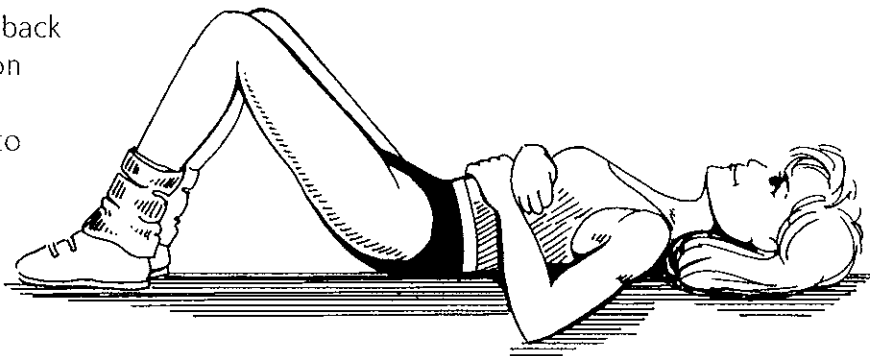
Back Pain Relief

Back injuries require the attention of a specialist. For relief of small aches, lie on your back on a padded surface and elevate your feet (with bent knees) on a padded chair. Place a small pillow or rolled-up towel under your neck and rest in this position for 10 to 15 minutes.



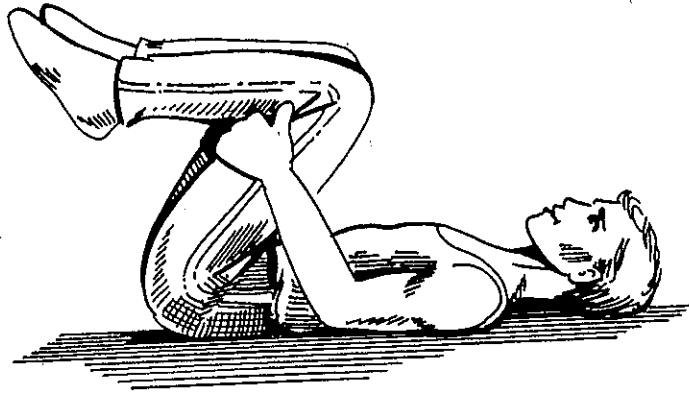
Five Exercises for a Healthy Back

1. **Pelvic Tilt** Lie on your back with knees bent, arms on chest, and feet on floor. Press the lower back into the floor by tightening the abdominal muscles and slightly lifting the buttocks off the floor. Hold for 10 seconds and repeat 8 to 15 times.

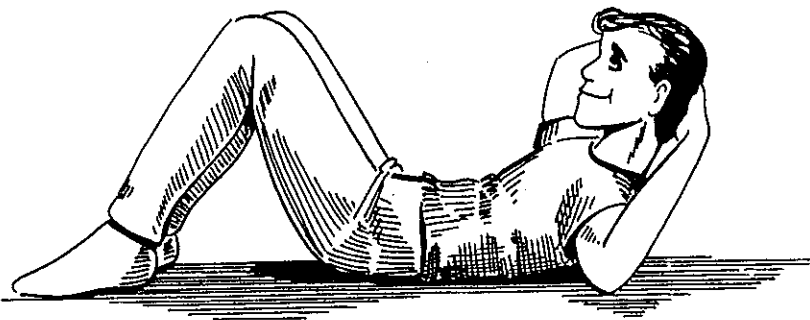


2. **Hamstring Stretch** Lie on your back, with both knees bent and one foot on the floor. Grasp behind the lifted knee, bring it toward the chest, and hold for several seconds. Repeat 3 to 5 times on each leg.

3. **Tuck-Hold** Tuck both knees to chest and slowly tighten tuck with arms while you press your lower back into the floor. Keep your back flat. Hold for 15 seconds and repeat 5 to 10 times.

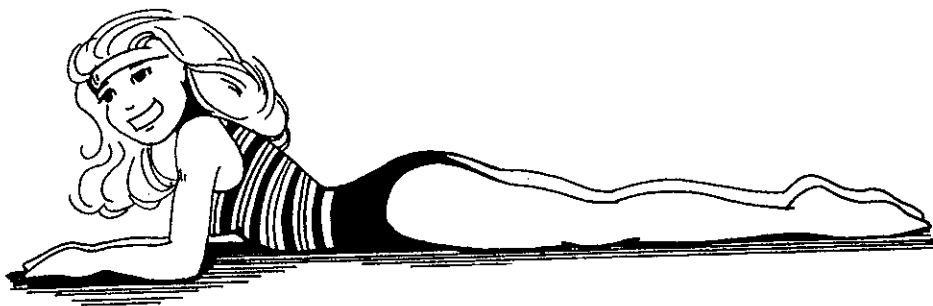


4. **Slow Crunch** Lie on your back with your knees bent at a 45-degree angle and your head supported at the base of the neck by your hands. Slowly lift your chest as you press your lower back into the floor; then slowly lower. Try lifting your buttocks slightly off the floor as you raise the chest. Repeat 8 to 25 times.



5. **Prone Prop** While on your front, lift your chest off the floor and hold by propping your elbows on the ground. Open your legs slightly.

Variation: Same as prone prop, only straighten your arms. For both, relax your hips and abdominals and hold for several seconds and then lower. Repeat 3 to 5 times.



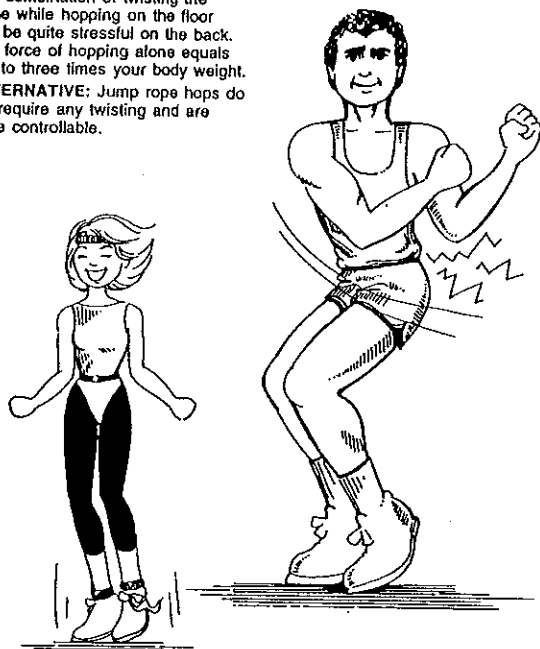
MAXIMIZE YOUR RESULTS, MINIMIZE YOUR RISKS

Not all exercises are good for you. Here are some unsafe or poorly executed exercises with their preferred alternatives.

TWISTING HOPS

The combination of twisting the spine while hopping on the floor can be quite stressful on the back. The force of hopping alone equals two to three times your body weight.

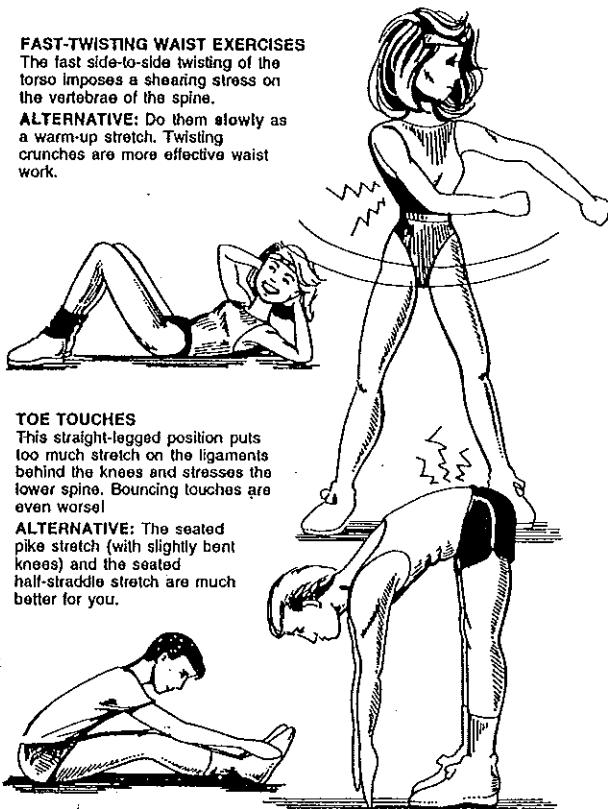
ALTERNATIVE: Jump rope hops do not require any twisting and are more controllable.



FAST-TWISTING WAIST EXERCISES

The fast side-to-side twisting of the torso imposes a shearing stress on the vertebrae of the spine.

ALTERNATIVE: Do them slowly as a warm-up stretch. Twisting crunches are more effective waist work.



TOE TOUCHES

This straight-legged position puts too much stretch on the ligaments behind the knees and stresses the lower spine. Bouncing touches are even worse!

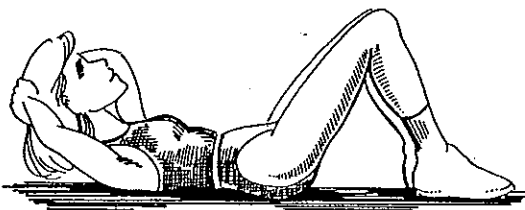
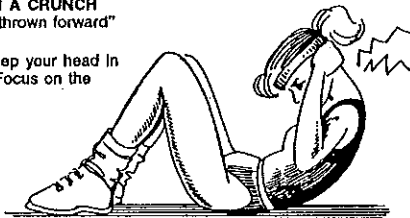
ALTERNATIVE: The seated pike stretch (with slightly bent knees) and the seated half-straddle stretch are much better for you.



HEAD THROWS IN A CRUNCH

Often the head is "thrown forward" during a crunch.

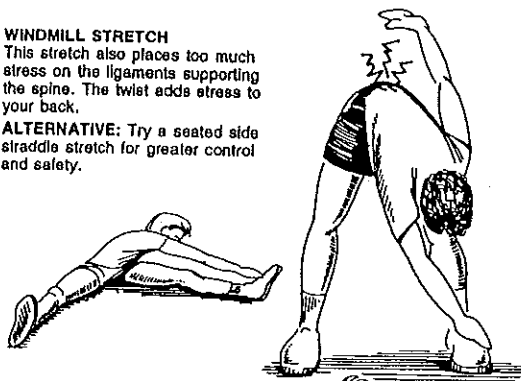
ALTERNATIVE: Keep your head in a neutral position. Focus on the ceiling.



WINDMILL STRETCH

This stretch also places too much stress on the ligaments supporting the spine. The twist adds stress to your back.

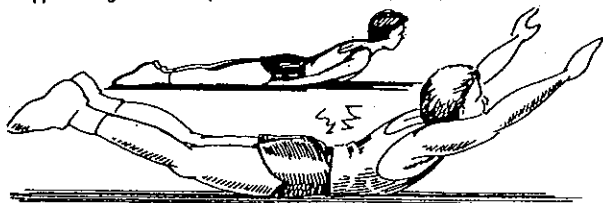
ALTERNATIVE: Try a seated side straddle stretch for greater control and safety.



SWAN LIFTS

The combination of arching the lower spine as the muscles are contracting can injure the back.

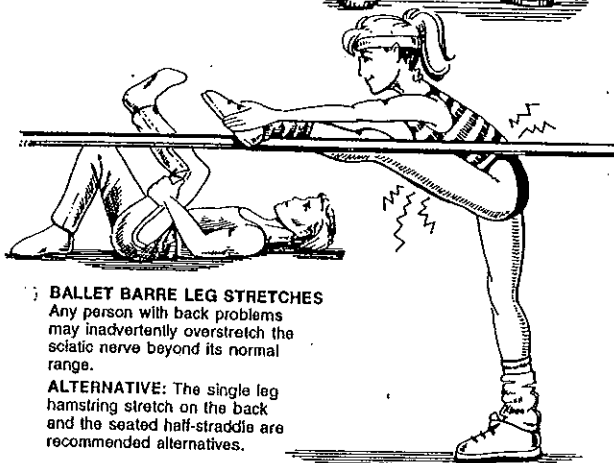
ALTERNATIVE: Keep the lower body on the floor and only lift the upper body, as in the back extension. Or, lift one arm in front and the opposite leg in back. Repeat the movement lifting the opposite limbs.

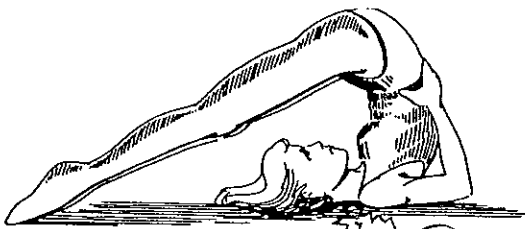


BALLET BARRE LEG STRETCHES

Any person with back problems may inadvertently overstretch the sciatic nerve beyond its normal range.

ALTERNATIVE: The single leg hamstring stretch on the back and the seated half-straddle are recommended alternatives.





THE PLOW

This movement places too much stress on the discs and bones of the neck. It may inhibit breathing and blood flow.

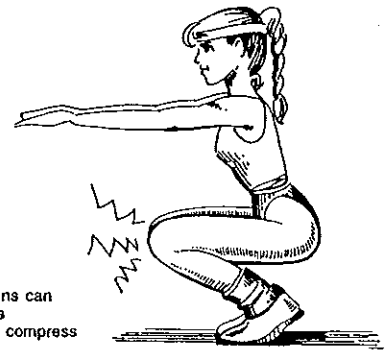
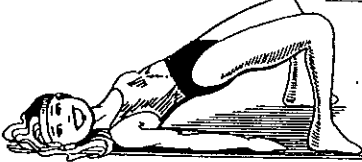
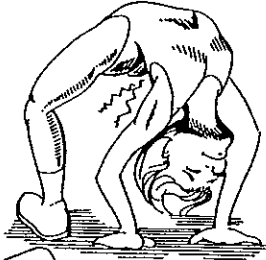
ALTERNATIVE: The seated pike stretch (with soft knees) is more effective.



GYMNASTICS BRIDGES AND PELVIC LIFTS

The gymnastics bridge, designed to stretch the upper back and shoulders, is usually performed with an over-arched lower back. Pelvic lifts are frequently over-arched as well.

ALTERNATIVE: Use the prone prop or prone extension instead of the bridge. And be careful not to over-arch when performing the pelvic lift.



DEEP KNEE BENDS

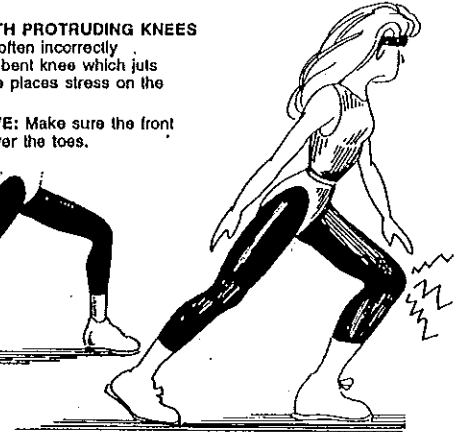
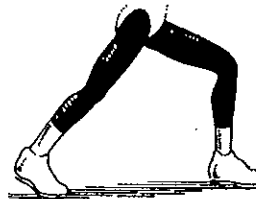
Deep knee bend variations can overstretch the ligaments supporting the knee and compress the cartilage.

ALTERNATIVE: When squatting, keep the knees from protruding past the toes and lower your buttocks to just above your knees.

LUNGES WITH PROTRUDING KNEES

The lunge is often incorrectly performed. A bent knee which juts past the ankle places stress on the knee.

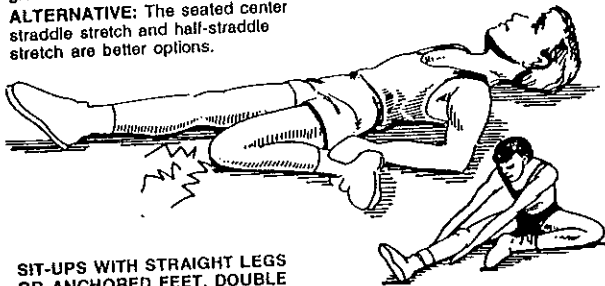
ALTERNATIVE: Make sure the front knee stays over the toes.



HURDLER'S STRETCH

This exercise can overstretch the muscles in the groin and the ligaments of the bent knee.

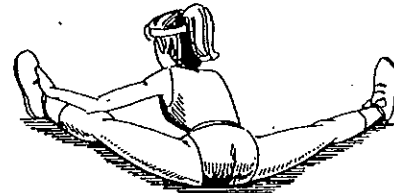
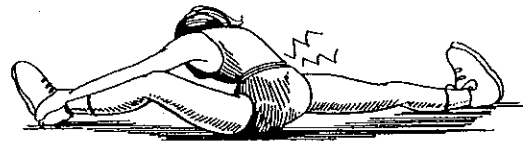
ALTERNATIVE: The seated center straddle stretch and half-straddle stretch are better options.



SIDE STRADDLE STRETCH

If you allow the opposite hip to come off the floor while stretching to the side, you place the hip and spine in poor alignment.

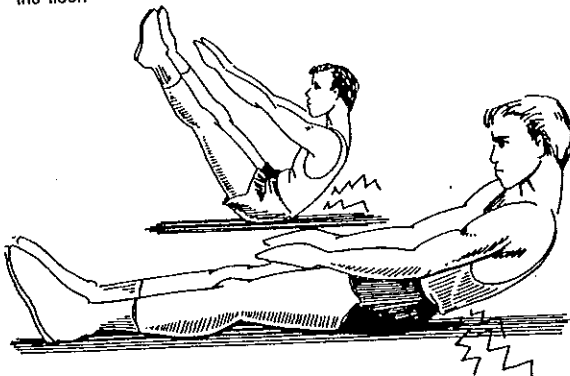
ALTERNATIVE: Keep the buttocks and legs firmly on the floor.



SIT-UPS WITH STRAIGHT LEGS OR ANCHORED FEET, DOUBLE LEG LIFTS, JACKKNIFE SIT-UPS

These exercises predominantly use the hip flexors (the muscles in front of the thigh which attach to the lower back), not the abdominals! Their repeated performance may lead to back problems.

ALTERNATIVE: Use the "crunch" variations which bring your ribs towards your pelvis as you lift only your shoulders and upper back off the floor.



NECK EXTENSIONS AND 360 DEGREE HEAD ROLLS

Taking the head straight back, as in neck extensions or full head rolls, may place too much stress on the disks of the neck vertebrae.

ALTERNATIVE: Neck rotation and lateral flexion are much safer. It is O.K. to bring the head forward and back, but avoid taking it too far past its neutral position when moving posterior.



Counting heart rate right

By John P. Porcari, Ph.D., Maurita Robarge, M.S., & Robert Veldhuis, M.S.

Begin count with 'one,' unless the start of the clock coincides exactly with a heartbeat.

EXERCISE INTENSITY is frequently prescribed using pulse rate as a guide. While the pulse can be felt at either the wrist or side of the neck, there seems to be some confusion as to how to most-accurately count one's pulse: When counting, do you start at zero or do you start at one? When posed with the question by one of my co-authors, I had to think. My conclusion was to start at one. Counting the first beat as zero will consistently underestimate exercise heart rate (HR). If the pulse is counted for 10 seconds, the magnitude of the underestimation will be six beats per minute (bpm), since the 10-second count is multiplied by six to get bpm.

The following examples illustrate the point. Using an electrocardiogram (ECG), HR can be determined by counting the number of cardiac cycles occurring in a six-second period and multiplying

by 10 to get bpm. To use this method effectively, you must first find a QRS complex (spike), which falls on a heavy black line of the ECG strip (see Figure 1). That complex is counted as zero, and is considered your reference point. The next occurring complex is counted as one (representing one complete cardiac cycle from the reference point) and you continue counting until the end of the six-second period. In Figure 1, there are three complexes beyond the reference point, thus the

HR is 30 bpm. (Three complexes multiplied by 10).

For another example, see Figure 2a. A represents the beginning and B represents the end of the six-second strip. The first complex falls on the heavy black line, which begins our six-second period, so we will use this as a reference point and count it as zero. As we continue counting, we can see that there are seven complexes falling within the six-second period; multiplying by 10 gives us a HR of 70 bpm.

When we typically monitor exercise HRs, especially in a group setting, we do not have the luxury of starting the clock on a specific beat (can you train everyone's heart to beat in unison?). We just say "start," let the clock run for 10 seconds, and say "stop." Everyone is at a different point in the cardiac cycle so there is no unique reference point.

Figure 2b is the exact same tracing as in Figure 2a and illustrates what happens when you count pulse rate when the clock is not synchronized to a specific complex. The clock was starting at point A and stopped at point B. If we start counting at zero (numbered above the complexes), we count six complexes in the six-second time period; multiplying by 10 gives us a HR of 60 bpm. If we start counting at one (numbered below the complexes), we count seven complexes in the same period; multiplying by 10 yields a HR of 70 bpm. The actual HR in this particular example, as we saw in Figure 2a, was 70 bpm.

As previously mentioned, exercise HRs are most often represented as 10-second counts. Figure 3 is an example of an individual exercising at a HR of 138 (as determined by the microprocessor on a Marquette ECG machine). Point A to point B represents 10 seconds of time. If we start at zero and count the number of complexes (numbered above the complexes) occurring in the 10-second period, we get 22; multiplying by six gives us a HR of 132 bpm. If we start at one (numbered below the complexes), we get 23; multiplying by six yields a HR of 138, which agrees with the HR determined by the ECG machine. Thus, as you can see, starting at zero resulted in a six-bpm underestimation of HR.

Starting at one is *not* incorrect if the clock is started on a specific beat, which becomes your reference point. This method is very difficult and is only useful if an individual is palpating their own pulse and controlling the clock at the same time (or someone is doing these tasks for them). Starting at one is more appropriate and is the only method that can be used in a group setting. All of this assumes that your participants can locate and count their pulse in the first place, but that's another story. □

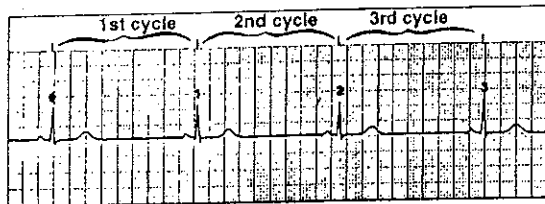


Figure 1. Determining heart rate using a 6-second strip.

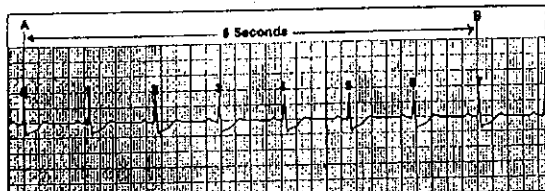


Figure 2a. Example of determining heart rate when the 6-second strip is started on a specific beat.

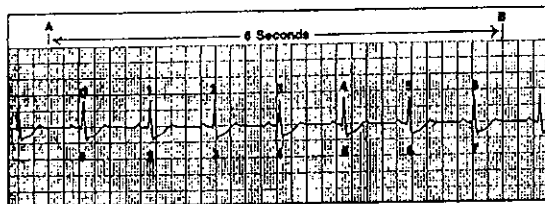


Figure 2b. Example of determining heart rate when the 6-second strip is not synchronized to a specific beat.

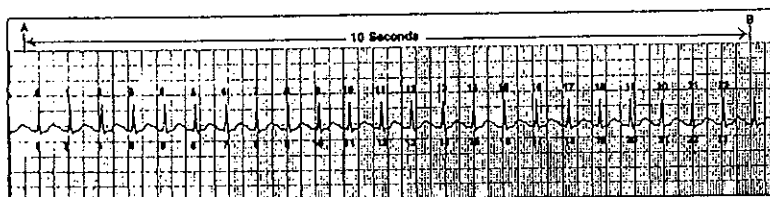


Figure 3. Example illustrating the differences in counting exercise heart rate when the clock is started on a specific beat (numbered above the complexes) and unsynchronized to a specific beat (numbered below the complexes).

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Perceived Exertion

You can also monitor exercise intensity through the use of perceived exertion. With perceived exertion, you interpret various body sensations such as heart rate, muscle and joint sensations, breathing intensity, and body temperature, and subjectively estimate your exercise intensity. A model that corresponds exercise heart rate with perceived exertion has been developed by Gunnar Borg, a Swedish physiologist. Notice that by adding a "0" to the numbers of the perceived exertion scale, it correlates to your exercise heart rate intensity. This is a great way to learn to listen to your body and compare your results to your counted heart rate. An easy way to know if you are within your ideal aerobic exercise intensity is to perceptually monitor your breathing intensity. If you are aware of a deeper and more frequent breathing pattern but are not hyperventilating and can still talk to an exercise partner (or perhaps cite the "Pledge of Allegiance"), you are probably exercising within the desired aerobic exercise intensity range. For improvement of your aerobic capacity, ACSM recommends training in the 12 to 16 range of the perceived exertion scale.

Finding Your Pulse

Rate of Perceived Exertion Scale

6	
7	Very, very light
8	
9	Very light
10	
11	Fairly light
12	
13	Somewhat hard
14	
15	Hard
16	
17	Very hard
18	
19	Very, very hard
20	



From Borg, G. "Perceived Exertion: A Note on History and Methods." *Medicine and Science in Sports and Exercise* 5:90-93, 1983.

Class: PEP 305

Host and facilitator: Dr Len Kravitz

Guest presenter: Dr Alison Murray

Focus: Strength endurance development (pre and early season)

Rationale: European approach to conditioning is to attain general fitness and mobility prior to using manipulatives (weights, elastics etc.)

Management: The circuit can be manipulated to reach all goals across macrocycle

E.g. Fall- Use a monster mash (pitch/field –based and integrated with bouts of aerobic type locomotor skills as to increase cardiovascular endurance aspects

Spring- Use with weights and integrate active rest mobility) component) as to raise intensity and reduce aerobic component

Autonomy and Modification: For student autonomy and accountability, you are being challenged to ‘tailor’ each movement to your own needs and contraindications. This is a tool that we need to use as educators (global sense). The teacher does not need to hear 30 separate “I can’t’s” (as may occur in a middle school setting where this is their favorite phrase). So we model, provide a rationale, and structured choice. Exercises need to be adapted or even switched out as guided by client needs. In small groups we can tailor exactly- with large groups we simply teach the concept and give the responsibility back to the client (thus developing autonomy). We can do this only when we assist them in this process- provide some examples, and be supportive of their ideas- if they follow safe principles and the same training concept- the outcome goal will remain similar.

Safety: Drink water as required (in between work bout levels, walk if need an active break, notify instructor if feel unwell.

Work out: “10-to-1; The Monster Mash”

Equipment: None (or mats if available)

Time: 20-30 minutes as determined by approach

Organization: Mats, music, posters (visual guide) if desired

Temporal training period: Base training (micro cycle 1-2 of annual program)

1) **Environment:** Outside (soft grass such as soccer field) preferable, if inside use small individual mats or adapt exercises accordingly

2) **Task:** Modeled and practiced; hand out provided. Therefore no constraints anticipated

3) **Individual:** Group unknown, so safety principles of exercise adaptation outlined and modeled.

Inter level activity: Run/jog/power walk between each level- self select intensity

This routine will follow a 10-to-1 pattern. Each exercise cited will be repeated ten times, and then nine times, eight and so on until we reach the number 1.

Training principle: left and right = 1 (For two sided exercise, count its execution to both the left and right sides as only once).

If you need an active break, walk around the cones in between levels

Water break- take if required but with the flow of the activity (so go in a natural break) e.g. following the first 5 sets, jog a lap and take a drink.

This circuit is designed to be worked continuously

Goal: Find and keep to a rhythm that will take you from 10 to 1 without having to stop, then listen to your body, heart rate and react and anticipate accordingly.

Slow jog or power walk 5 minutes following with stretch as reflect upon process.

Post activity Reflection & Task

1) How could this PROGRAM be modified for two groups: ‘Athletes’ and ‘Entry level students’ Class, Write a few sentences and submit to Dr. Kravitz on a separate sheet of paper.