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Article 10

Promoting Physical Wellness on a Commuter Campus: Learning Key Principles of Exercise Prescription to Enhance Program Design

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Darren A. Wozny and Cheryl A. Wozny

Wozny, Darren A., is an Associate Professor of Counselor Education at Mississippi State University-Meridian. Dr. Wozny is the principal investigator and project director of the Mississippi State University-Meridian Campus Suicide Prevention Program (Complete) (funded by consecutive SAMHSA three year grants # 1H79SM057854-01 and 1U79SM058943-01). His areas of specialty include ethics, marriage and family therapy, multicultural issues in counseling, and suicide prevention/intervention.

Wozny, Cheryl A., is a physical therapist at Rush Hospital in Meridian, Mississippi. Dr. Wozny received her Bachelor of Science in Physical Therapy from the University of Saskatchewan, and earned her Doctor of Physical Therapy (DPT) from the University of Mississippi Medical Center. Dr. Wozny has been practicing physical therapy for 16 years.

Introduction

The aim of our wellness-based campus suicide prevention program (supported by three-year SAMHSA grant) is to increase overall campus community wellness as a protective factor against the risk of campus suicide. The first online wellness module that will be implemented is the physical wellness-exercise module. The rationale for this practice-based proposal is that people continue unhealthy exercise patterns (starting and stopping self-designed exercise programs) due in large part to a lack of knowledge related to key principles of exercise prescription. Participants will learn about common issues associated with premature termination of self-developed exercise programs and will learn about key principles of exercise prescription to enhance the sustainability of self-developed exercise programs.

Statement of the Problem

Suicide on College Campuses

In the United States, suicide at both the national level and on college campuses is a major public health problem. The American College Health Association (2001) national survey of 16,000 students across 28 college campuses reported that 9.5% of college students had suicidal ideation, 1.5% had made a suicide attempt, 50% had reported feeling very sad, 33% reported feeling hopeless, and 22% reported feeling depressed to the point of impaired functioning.

Despite the issue of suicide on college campuses, going to college and staying in college is still a protective factor for suicide risk. The Big Ten Suicide Study (Silverman, Meyer, Sloane, Raffel, & Pratt, 1997) identified reported suicides among Big Ten University campuses over a 10 year period and reported a college suicide rate of 7.5 per 100,000. However, the general population suicide rate when matched for age, gender, and race was 15.0 per 100,000 (Potter, Silverman, Connerton, and Posner, 2004). Thus, colleges and universities need to address the issue of suicide through implementation of comprehensive suicide prevention programs that are linked to campus/community mental health services, thus providing students with safe, supportive learning environments to stay in school.

Although suicide and related mental health issues are a problem for the general college population, there are some college subpopulations that are at increased risk for suicide, particularly males, older students (25 years and older), and graduate students (both males and females; Silverman et al., 1997). Nontraditional students (25 years and older) have some unique stressors that include commuting to college (less able to participate in extra-curricular college activities), loss of status if they have to quit work to attend college (Silverman, 2004), work/family/school balance for those students that attend school while continuing to work and raise families, and academic related challenges of returning to school after a prolonged absence (Potter et al., 2004). This highlights the need for campus suicide prevention programs on commuter college campuses.

Campus Suicide Prevention Programming

The Campus Suicide Prevention Grant Program is sanctioned under the Garrett Lee Smith (GLS) Memorial Act and the Substance Abuse and Mental Health Services Administration (SAMHSA) and provides Campus Suicide Prevention Grants for colleges and universities. Grants associated with this program seek to improve services for college students and their families struggling with behavioral and mental health issues that could put them in danger of suicide attempts and suicide. Recipients of these grants may develop various methods and strategies to attain their objectives related to the core grant program activities (Substance Abuse and Mental Health Services Administration [SAMHSA], 2009).

MSU-Meridian Campus Suicide Prevention Program

The purpose of the MSU-Meridian Campus Suicide Prevention Program is to: enhance campus mental health (wellness); early identify and engage at-risk students; and

implement helping interventions that may include counseling referral before students engage in serious suicide planning, or suicidal behavior.

The MSU-Meridian Program proposes to sustain the current components of our secondary suicide prevention program (early identification and engagement of at-risk students, implementing helping interventions that may include counseling referral) and build on primary wellness-based suicide prevention components (developing overall wellness with campus students, faculty, and staff as protective factors against suicide).

The MSU-Meridian Campus secondary suicide prevention program components that will be sustained include: (a) mental health network between campus and community mental health services; (b) crisis response plan to include responses to suicide; (c) integration of Lifeline throughout program; (d) informational materials for students and families; (e) gatekeeper workshops – faculty/staff, and student peer helpers; (f) College Response online clinical screening; (g) anti-stigma artwork (paintings) series; and (h) student peer helper program.

The wellness-based primary suicide prevention components that will be added include: (a) each month on campus will feature a different wellness component theme/campus activities designed to develop a particular wellness component (e.g., exercise may include the campus activity of “yoga class”); (b) wellness component online mini-courses based on the 17 component Indivisible Self Model of Wellness (Myers & Sweeney, 2004) that will further develop wellness through additional exercises/activities.

Physical Wellness – Exercise: Issue of Obesity in United States and Mississippi

Obesity is a critical health problem in the United States. The Centers for Disease Control (CDC) define an individual as obese if that person has a body mass index (BMI) greater than 30. Ogden, Carroll, McDowell, and Flegal (2007) found that 34% of American adults over age 20 are obese and that includes 33.3% of adult men and 35.3% of adult women. The current obesity rates in the United States are still significantly higher than the Healthy People 2010 national health objectives (U.S Department of Health and Human Services, 2000) that aimed to reduce obesity rates to less than 15% of adults. However, some states are significantly closer to the national health objectives for obesity than other states. The overall average state obesity rate in the United States for 2007 (which includes children, adolescents, and adults) is 25.6% with a range from a low of 18.7% (Colorado) to a high of 32.0% (Mississippi; Centers for Disease Control, 2008). Thus, states with the highest rates of obesity will benefit most from physical wellness programming (i.e., diet and exercise intervention programs).

In order to begin to address the high rate of obesity in Mississippi, it is important to focus intervention programs on the subpopulations with the highest obesity rates. Nationally, the rate of adult obesity varies considerably by age and race/ethnicity. For both men and women, middle-aged adults (aged 40-59 years) had the highest reported rates of obesity (men – 40.0%; women – 41%). Comparatively, young adults (aged 20-39 years) and older adults (60 years and older) reported lower rates of obesity than middle-aged adults (young adults – 28.0% of men and 30.5% of women; older adults – 32.0% of men and 30.5% of women; Ogden et al., 2007). For women, obesity rates also vary considerably by race/ethnicity. Among middle-aged women (aged 40-59 years), non-Hispanic black and Mexican-American women reported the highest obesity rates (53% and 51% respectively) compared to 39% of non-Hispanic white women (Ogden et al.,

2007). Thus, in Mississippi, physical wellness programming that targets middle-aged (aged 40-59 years) adults, and non-Hispanic black and/or Mexican-American women would begin to help address the issue of obesity.

Development of Wellness Component Exercise Module

The aim of our wellness-based campus suicide prevention program (supported by three-year SAMHSA grant) is to increase overall campus community wellness as a protective factor against the risk of campus suicide. Our campus suicide prevention program will develop and implement 17 online wellness modules that are consistent with the Myers and Sweeney (2004) Indivisible Self Model of Wellness that includes several domains of individual wellness (i.e., physical, creative, coping, social, and essential). The first online wellness module that will be implemented is the physical wellness-exercise module.

Common Issues Associated with Premature Termination of Self-Developed Exercise Programs

Many students, faculty, and staff self-develop their own exercise program but prematurely terminate their exercise programs due to one or more common issues:

1. **Increasing exercise intensity prematurely.** By increasing exercise intensity prematurely the extra demand load often results in increased soreness as the body tries to adapt. For example, an individual increases their bench press from 120 pounds (first week) to 180 pounds (second week).
2. **Failure to increase exercise intensity.** Our body adapts based on the physiological stimulus presented (exercise program) and failure to change an exercise program will result in an exercise gain plateau as the body adapts to the same exercise program (same stimulus). For example, if an individual begins using bench press with 120 pounds for 8-12 reps, the individual's body will adapt to be able to handle that demand load, though if the 120 pounds is not changed through progression, the individual's body will plateau in terms of muscle mass development.
3. **Boredom with exercise program.** Exercise programs need exercise variety (periodic change) in order to continue to engage the individual. For example, if an individual engages regularly in the same 10 resistance training exercises, boredom may occur. The individual could change the exercises, setting, or equipment used (e.g., free weights, exercise machines, resistance bands, body weight-resistance).
4. **Inappropriate exercise duration.** Inappropriate exercise duration involves exercising either too little or too long per session. Generally, resistance training sessions should not exceed 60 minutes, as longer sessions are associated with increased risk of dropout (Weir & Cramer, 2006). For example, if an individual engages in resistance training for 10 minute sessions, it is insufficient to exercise all major muscle groups. Another individual engages in resistance training twice for two hours per session but later gives up because exercising demands too much time from his schedule.

5. **Inappropriate exercise frequency.** Inappropriate exercise frequency involves exercising either too infrequently that the habit is not maintained (e.g., once every two weeks) or so frequently that the body does not have a chance to rest and recover (e.g., exercising everyday).

Key Principles of Exercise Program Design

Utilizing the key principles of exercise program design can address many of the common issues associated with premature termination of self-developed exercise programs. To demonstrate how the key principles of exercise program design guide the development of an exercise plan, we will present an instructor's example of a viable exercise plan.

The instructor's exercise plan addresses three fitness goals: (a) to increase cardio endurance (cardiorespiratory program); (b) to develop muscle strength (resistance training – muscle strength); and (c) to become more flexible (flexibility training).

Instructor Example – Part A: Cardiorespiratory Endurance Exercise Program

The first guideline in development of a beginner-level cardiorespiratory endurance program is establishing the *exercise mode*. *Exercise Mode* is the type of exercise implemented and utilizes the specificity of exercise principle (Wallace, 2006, p. 337). For example, if your goal is cardiorespiratory endurance, you must choose an exercise that will improve your cardiorespiratory endurance. Jogging would work but weight lifting will not. Wallace (2006) indicates that cardiorespiratory endurance exercises should utilize large muscle groups. How does an individual decide which cardio exercises to include in their program? There are lists of physical activity available but the individual must first determine the level of exercise intensity before choosing an exercise mode.

The second guideline is *exercise intensity*. *Exercise intensity*, measured as percentage of capacity, is the effort (Wallace, 2006, p. 337). For example, maximum intensity requires 100% of your capacity or effort, while sub-maximal intensity is any effort that is less than 100% of your capacity. For the beginner-level, it is recommended that the exercise intensity target be exercises with moderate-level intensity (Wallace, 2006). One method to determine if an exercise is moderate-level intensity is to use the *Talk Test* which assesses whether an individual can carry on a normal conversation while engaging in a particular exercise. The CDC has an excellent resource titled *General Physical Activities by Level of Intensity* (n.d.). After reviewing this list, the instructor needed to identify a cardio activity (exercise mode) that reflected moderate-level intensity (exercise intensity) and selected walking on level ground at a moderate to brisk pace.

The third guideline is establishing the *exercise frequency*. *Exercise frequency* is the number of sessions per week and number of sessions per day that you exercise (Wallace, 2006, p. 337). For a beginner-level, Wallace (2006) recommends an exercise frequency of 3 days per week (minimum) and work toward 5 days per week. The instructor decides that because the exercise is walking, that 5 days per week would be appropriate.

The fourth guideline is establishing the *exercise duration*. *Exercise duration* is the total time, measured in minutes, for each exercise session (Wallace, 2006, p.337).

Beginners could start with 10 minutes and work towards 20 to 30 minutes per session (maximum of 150 minutes per week; *CDC Physical Activity for Everyone: Guidelines*, n.d.). The instructor decides to engage in walking 30 minutes per day, five days per week for a total of 150 minutes which is the recommended amount of cardio activity per week for adults.

The fifth guideline is addressing the need for *exercise progression*. *Exercise progression* is the aspect of exercise prescription that helps an individual to continue to enhance and maintain their physical fitness (Wallace, 2006). The instructor selected several methods to address the need for *exercise progression* in his program (change to vigorous-intensity activity); (a) walk on hilly ground; (b) change to walk-run program on flat ground; (c) change to walk-run program on hilly ground.

Instructor Example – Part B: Resistance Training - Muscle Strength Exercise Program

The first guideline in development of a beginner-level resistance training exercise program is *exercise selection*. *Exercise Selection* is defined as the choice of specific exercises for a resistance training program. Resistance training exercises fall into two primary categories: (a) *core exercises* are multi-joint exercises that involve the large muscle groups such as the chest, shoulder, back, hip, or thigh; (b) *assistance exercises* are single-joint exercises that target smaller muscle groups such as the neck, trapezius, biceps, triceps, forearm, abdomen, low back, or anterior/posterior leg muscles (Weir & Cramer, 2006, p. 357). It is recommended that all major muscle groups are targeted (as tolerated) when selecting exercises for a resistance training program (Weir & Cramer, 2006, p. 357). See Appendix A and note that both training day workouts include total body workouts that primarily focus on core exercises (e.g., chest – bench press) with some supplemental assistance exercises (e.g., bicep – bicep curls).

The second guideline is *order of exercise*. *Order of exercise* means that if training all major muscles in a single exercise session, core exercises should come before assistance exercises and upper and lower body exercises should be alternated (Weir & Cramer, 2006, p. 357). See Appendix A and note that both training day workouts include core exercises first (Day 1 – shoulders, hip, chest, thigh and back; Day 2 – shoulders, hip, chest, and back); assistance exercises (Day 1- biceps and abdomen; Day 2 – legs-calf, triceps, and abdomen) are toward the end of the exercise program, and upper and lower body exercises are alternated in the exercise program.

The third guideline is establishing the *training frequency*. *Training frequency* is defined as the number of resistance training sessions per week. For beginners, the total body should be trained in a single session at a frequency of 2-3 days per week (Weir & Cramer, 2006, p. 357). The instructor decided to plan to complete two resistance training workouts per week with two different total body workouts (see Appendix A).

The fourth guideline is determining the *training load*. *Training load* is defined as the amount of weight used in a resistance training exercise; novice individuals should complete 8-12 repetitions with 60-65% 1RM for (for strength; Weir & Cramer, 2006, p. 357). One repetition maximum (1RM) is the maximum amount of weight an individual can safely complete one repetition of in a resistance exercise. For example, if 50 pounds is the maximum weight where you can complete one bicep curl, then that individual's 1RM for bicep curl is 50 pounds. In the instructor's example, his 1RM for bench press

(flat) and inclined bench press is 200 pounds. Thus, the training load guideline is 60-65% of 1RM, so the instructor should use 120-130 pounds as a starting point for those chest exercises. This training load must be estimated for all exercises in the program.

The fifth guideline is establishing the *training volume*. *Training volume* is defined as the sum of the total number of repetitions multiplied by the sum of the resistance (load or weight) used during a single training session. For novice individuals, single set resistance exercises can increase exercise compliance. Multiple sets should be limited to a range of 2-3 sets as a maximum (Weir & Cramer, 2006, p. 359). In our instructor's program (see Appendix A), he decided to start slow with just a single set for each resistance exercise but gradually increase to 2-3 sets for each exercise.

The sixth guideline is determining the *rest period duration*. *Rest period duration* is the amount of rest allotted between consecutive sets of the same exercise. For all levels of training, it is recommended that 2-3 minutes of rest occur for core exercises, and 1-2 minutes of rest for assistance exercises (Weir & Cramer, 2006, p. 360). In our instructor's program (see Appendix A), the core exercises (shoulders, hip, chest, thigh, and back) will require 2-3 minutes rest. There should also be 2-3 minutes rest between sets of different core exercises (e.g., after completion of military press and first set of standing lunges). Furthermore, there would be a smaller rest break (1-2 minutes) after bicep curls because it is an assistance exercise.

The seventh guideline is addressing the need for *exercise progression*. There are three methods to address the need for exercise progression in this instructor's program: (a) increase training load or weight used (increase gradually); (b) increase training volume (increase number of repetitions or sets per exercise); and (c) increase training frequency (increase number of resistance training days per week). It is important to note that methods of progression should be implemented separately rather than concurrently (e.g., avoid increasing number of sets of bench press and amount of weight at the same time).

Instructor Example – Part C: Flexibility Exercise Program

The first guideline in development of a beginner-level flexibility program is *exercise mode*. Weir and Cramer (2006) indicate that static stretching is appropriate for all individuals. *Static stretching* is a slow, controlled, and constant stretch that procedurally involves gradually applying tension to the muscle or muscle group toward the end of the joint ROM until the point of mild discomfort (Weir & Cramer, 2006, p. 363). In our instructor's example of a flexibility program (see Appendix B), all stretches are static stretches.

The second guideline is *exercise selection*. Flexibility training is joint-specific, thus training should involve flexibility stretching for the primary joints of the body (e.g., neck, shoulders, elbows, wrists, trunk, hips, knees, and ankles; Weir & Cramer, 2006). In our instructor's program (see Appendix B), the selected static stretches (16 stretches) include all primary joints of the body.

The third guideline is *exercise repetitions*. Weir and Cramer (2006) recommend two-three repetitions should be performed for each of the stretching exercises. In our instructor's program (see Appendix B), the selected static stretches will each be performed for two-three repetitions.

The fourth guideline is determining the *exercise duration of each repetition*. Weir and Cramer (2006) recommend that beginners should hold stretches for 10 seconds and work towards the optimum level of 30 seconds per stretch. In our instructor's program (see Appendix B), the selected static stretches will be held for 10 seconds (minimum), though longer, when possible.

The fifth guideline is establishing the *exercise frequency*. Weir and Cramer (2006) recommend that beginners minimally engage in their flexibility program 2-3 days per week. In our instructor's program (see Appendix B), he will practice static stretches two days per week.

The sixth guideline is determining the *exercise intensity*. Weir and Cramer (2006) recommend that the stretches should be held until point of tightness or mild discomfort. In our instructor's program (see Appendix B), he will hold the static stretches for 10 seconds but will attempt longer, when possible.

The seventh guideline is addressing the need for *exercise progression*. In our instructor's program (see Appendix B), he has three methods of exercise progression: (a) increase duration of each stretch repetition (60 seconds maximum); (b) increase frequency of flexibility exercises to five days per week; (c) increase number of repetitions of each stretch to four repetitions (maximum).

Future Directions

It is our hope that campus faculty, staff, and students will utilize the above exercise guidelines to develop sustainable exercise programs to increase physical wellness as a protective factor against risk of suicide. The programmatic challenge will be increasing campus access to the information on exercise guidelines. Strategies that will be utilized include: (a) monthly campus emails (with a single guideline); (b) campus advertising through campus monitors; and (c) getting the message out through student peer helpers. When successful, well-designed exercise programs enhance the campus community's ability to manage the stressful challenges associated with college life.

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Appendix A

Instructor's Basic Resistance Training Program (Free Weights) (2 Days/Week)

Exercise	Muscles	Equipment	Training Volume
<u>Day 1</u>			
Military (Shoulder) Press	Shoulders	Free Weights (Dumbbells/Barbell)	8-12 reps (1-3 sets)
Standing Lunge	Hip/buttocks	Free Weights (Dumbbells/Barbell)	8-12 reps (1-3 sets)
Bench Press (Flat)	Chest	Free Weights (Dumbbells/Barbell)	8-12 reps (1-3 sets)
Squats	Legs-Thighs	Free Weights (Dumbbells/Barbell)	8-12 reps (1-3 sets)
Bent-Over Reverse Fly	Back	Free Weights (Dumbbells)	8-12 reps (1-3 sets)
Bicep Curls	Arms-Biceps	Free Weights (Dumbbells/Barbell)	8-12 reps (1-3 sets)
Bicycle Crunch Exercise	Abdomen	Body Weight-Resist	8-12 reps (1-3 sets)
<u>Day 2</u>			
Shoulder Fly (standing)	Shoulders	Free Weights (Dumbbells)	8-12 reps (1-3 sets)
Weighted Step-Ups (stool or chair)	Hip/buttocks	Free Weights (Dumbbells)	8-12 reps (1-3 sets)
Inclined Bench Press	Chest	Free Weights (Dumbbells/Barbell)	8-12 reps (1-3 sets)
Calf Raises	Legs-Calf	Free Weights (Dumbbells)	8-12 reps (1-3 sets)
Bent-Over Lat Pulls	Back	Free Weights (Dumbbells)	8-12 reps (1-3 sets)
Triceps Extensions	Arms-Triceps	Free Weights	8-12 reps (1-3 sets)
Planks (Hover)	Abdomen	Body Weight-Resist	8-12 reps (1-3 sets)

Appendix B

Flexibility-Based Exercise Program

General Stretching Guidelines

1. Warm up your muscles prior to stretching with 5 minutes of a light activity such as brisk walking.
2. Hold each stretch 20 to 30 seconds at the point of muscle tension but not pain. Do not bounce.
3. Repeat each stretch 3 times.
4. Stretch the muscles that you will be using and/or any muscles that feel tight.

Cool Down Guidelines

1. Cool down to bring heart rate out of working range.
2. Repeat stretches (from warm-up).

Stretching Exercises

1. **Neck side-stretch.** Place right hand behind your back. Grasp right wrist with left hand, gently pulling right hand to the left. Tilt left ear toward left shoulder stretching right neck musculature. Release and repeat on the other side.
2. **Neck forward stretch.** Relax shoulders and tuck chin into chest.
3. **Chest stretch.** Straighten both arms at your sides with your palm facing forward. Raise your arms to shoulder height, and reach both arms as far backwards as you are able.
4. **Back stretch (upper).** Reach both of your arms around to hug yourself.
5. **Back stretch (middle and lower).** Lay on the floor or a bed. Stretch arms out to either side. Bend up both knees, keeping feet flat on the floor or bed. Allow both knees to roll to the right while you turn your head to look to the left. Return to the middle and allow both knees to roll to the left while you turn your head to the right.
6. **Back stretch (upper, middle, and lower).** Assume a position on your hands and knees with your hands directly under your shoulders and your knees directly under your hips. Allow your back to arch up as you drop your head and tailbone. Now allow your back to sink down as you raise your head and tailbone.
7. **Biceps stretch.** Straighten both arms at your sides with palms facing backward. Lift your arms backwards up toward the ceiling. Repeat on the other side.
8. **Triceps stretch.** Raise right arm straight up toward the ceiling. Bend your elbow reaching behind your head to touch your upper back. Use your left hand to gently pull your elbow toward the back of your head. Repeat on the other side.

9. **Forearm stretch (outside of elbow).** Straighten your elbow with palm facing backward. Make a fist and bend your wrist so that your palm moves toward the inside of your wrist. Repeat on the other side.
10. **Forearm stretch (inside of elbow).** Straighten your elbow with your palm facing forward. Straighten your fingers and bend your wrist so that your palm moves away from the inside of your wrist. Repeat on the other side.
11. **Hip Flexor (front of hip) stretch.** Place right leg in front of left leg in a long stride. Allow left knee to touch the floor. Lean forward to stretch the front of the left hip. Make sure your right foot is far enough forward so that the right knee does not bend more than 90 degrees as you lean into the stretch. You may use a chair/stool beside you for extra balance if needed. Complete 3 stretches on the left hip before changing legs to stretch the right.
12. **Gluteus (Buttock) stretch.** Lay on your back with both legs straight. Lift your right knee toward your right shoulder and grasp your knee with both hands. Now pull your right knee toward your left shoulder. Adjust the angle of pull to where you feel the best stretch. Repeat on the other side.
13. **Hamstring (back of thigh) stretch.** Sit on the floor or a bed with right leg extended to the right side and left knee bent so that the left leg is resting on the floor/bed. Turn your body to the right and reach both hands as far down the right leg as you are able. Repeat on the other side.
14. **Quadriceps (front of thigh) stretch.** Stand with a chair or counter to your left side for balance. Bend your right knee to bring your right foot toward your buttocks. Grasp your right foot with your right hand increasing the bend in your right knee. Keep your knees together. Stand tall and gently pull your leg backward to increase the stretch. Do not allow your knee to flare out to the side. Repeat on the other side.
15. **Gastrocnemius (calf) stretch.** Stand with left leg ahead of your right leg in a long stride. Hold onto a chair or counter for balance if necessary. Straighten your right knee with your right heel pressing the ground. Allow your left knee to bend while keeping your right leg straight. Keep your chest up as your body moves forward. Repeat on the other side.
16. **Soleus (calf) stretch.** Adopt a short stride stance with the left leg forward. Keep both heels on the floor as you sink your buttocks down toward the right heel. This will feel slightly different than the Gastrocnemius (calf) stretch. Change legs and repeat.