ACSM Premium Resource

Patient Intake, Assessment and Program Design

A Clinical Case Study

- **Part 1:** Intake & Assessment
- **Part 2:** Goal Setting, Exercise Selection & Program Design

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Part One: Intake & Assessment

As a clinical exercise professional, it is critical to understand how patient intake/assessment, goal setting, exercise prescription and ongoing communications tie together. We will explore these processes from the clinical exercise physiologist's perspective.

The first thing we need to do is establish the patient's baseline by asking the following questions:

- **Who** referred the patient?
- **Why** are they starting the exercise program?
- **What** important considerations do I need to consider? (Previous injuries, disease state, medications, etc.)
- **When** will the patient begin their exercise program and how long will they continue?
- **How** and to whom are we going to communicate success, challenges and opportunities?

Let's look at the example below for Mrs. R.:

Mrs. R.'s severe obesity and inability to lose weight on her own prompted her referral to the clinical weight loss center. Her physician is concerned that without intervention she will develop Type 2 diabetes and heart disease. Her clinical findings are as follows:

- **Age: 62**
- **Gender: Female**
- **Comorbid conditions: Hypertension, insulin resistance, hypothyroid, previous ankle injury**
- **Height: 64" | Weight: 253 pounds | Total body water: normal**
- **BMI: 43.4 kg ? m-2 | Body fat: 44.2% | Muscle mass: 30.4 pounds**
- **BP: 132/84 mm hg | HbA1C: 6.1% | TSH: 2.2 mU/L**
- **Medications: Lisinopril, Metformin, Levothyroxine, Sertraline**

She is currently seeing a dietician in the office to address her diet.

For several years, she exercised on and off. She saw success with group classes but has increasingly felt uncomfortable in a group setting due to insecurities. Currently, she is walking her dog once or twice per day for 10 minutes at a very low intensity and isn't doing any strength or flexibility training.

Establishing a baseline (high blood pressure, prediabetes, obesity)

After reviewing the patient's medical record, three things immediately stand out: her blood pressure, prediabetes and obesity. She was referred for obesity, which comes with risk for other diseases. The typical supervised program is 12 weeks, so let's look at some clinical goals.

She qualifies as severely obese because her BMI is greater than 40 kg ? m-2 and she has 44.2% body fat. Our initial goal will be to get her out of the highest range for both factors. Her blood pressure is controlled with medication, but still reads at 132/84 mm hg which is Stage 1 high blood pressure. Also, her HbA1C is at 6.1%, classifying her as prediabetic. Our goal is to normalize those numbers by adding in positive lifestyle changes.

Data	Starting/classification	Goal/classification
BMI	43.4 kg ? m-2 severe obesity	<40 kg ? m-2 obese
Body Fat Percentage	44.2% very poor	34.4% poor
Muscle Mass	30.4 pounds	30.4 pounds
Blood Pressure	132/84 mm hg normal stage 1 high blood pressure	<120/<80 mm hg
HbA1C	6.1% prediabetes	<5.7% normal

*Data based on *ACSM's Guidelines for Exercise Testing and Prescription*. 11th ed. Philadelphia (PA): Wolters Kluwer; 2022. 548 p.

Establishing contraindications

With the above conditions, some considerations need to be taken. Hypertension can cause blood pressure to drop following an exercise session, resulting in lightheadedness. With prediabetes, post-exercise hypotension is a consideration.

The other piece of information that needs to be followed up on is the previous ankle injury. Information may need to be requested from a physical therapist or surgeon.

What happened? Were any interventions such as surgery, physical therapy, etc., performed and if so, what was the result? What limitations does she currently have? What movements, if any, cause her pain?

Communications and gathering additional information

The other clinician you are working with is the dietician. It is important to maintain a good rapport with the other clinical staff to provide the best all-around care for the patient.

Diet and exercise work in tandem to produce the therapeutic effects of lifestyle change. Working together, you can both be a source off accountability to Mrs. R. If problems occur, both clinicians can work together to solve them. Is she feeling lethargic? Is she consuming enough calories or water? Is she consuming enough protein to maintain muscle mass? Is she being compliant with her diet and/or exercise? By having open communication, a much better service is given to Mrs. R. and her compliance will hopefully be better.

The good news is that monitored, well-planned exercise can help improve blood pressure, improve insulin sensitivity, reduce body fat and maintain muscle mass!

Part Two: Goal Setting, Exercise Selection & Program Design

When designing an exercise prescription for Mrs. R., first we need to think of what our end goal for her would be in 12 weeks and then work our way back to her current state. Considerations need to be made for current fitness level, level of motivation, amount of time willing to devote to exercise and access to exercise.

One of our main goals is to maintain muscle mass while losing fat mass. Muscle mass is the driver of metabolism and if weight loss occurs from muscle mass, we will set her up for weight gain again by reducing her resting metabolism. With a calorie-restricted diet, the body tends to preserve fat mass at expense of muscle mass. The goal in developing an exercise prescription is not to simply lose weight. Instead, the goal should be to maintain, or even increase, Ms. R.'s lean muscle mass of 30.4 pounds while reducing her overall fat mass.

Cardiorespiratory exercise for weight loss is recommended by ACSM as 30-60 minutes at a moderate intensity progressing to vigorous intensity for five days per week or more. The great thing is that this also coincides with the recommendations for hypertension and prediabetes, so cardiorespiratory exercise is a priority to reduce body fat and lessen the risk factors for her other comorbid conditions.

Where does that leave us? At 12 weeks, ideally, we will have progressed Mrs. R. to this exercise prescription:

	Aerobic	Resistance	Flexibility
Frequency	5 days/week	3 days/week	3 days/week
Intensity	50%-65% HRR	60%-70% 1-RM	Stretch to point of tightness of slight discomfort
Duration	45-60 minutes	2-3 sets of 8-12+ reps for all major muscle groups	15-30 seconds per stretch

Let us break down what that will look like in three four-week blocks, and take a realistic look at how a clinical exercise physiologist can progress as close as possible to an ideal exercise prescription.

Block 1 (Weeks 1-4)

Our goal during the first four weeks is to establish a strength training routine along with an aerobic exercise routine. Strength usually gets pushed in favor of aerobic exercise, but that is a mistake with weight loss as we need that muscle mass. Start with limited range of motion and focus on exercises with higher rep counts targeting body weight.

To help prevent further ankle injury, start with just 30 minutes per day of aerobic exercise in 10-minute increments if needed, while encouraging a lower intensity. Again, our goal is just to establish the habit.

Day 1

Warm-Up
5 min walk
10 modified squats
10 side steps
10 arm circles each direction
Workout
Bodyweight chair sit to stand x 15
Wall pushups x 15
Weighted bicep curl x 15
Weighted overhead press (neutral grip) x 15
Weighted tricep extension x 15
Bodyweight alt. side lunges (limited ROM) x 15
Chair sit ups x 15
2 rounds
Cooldown/Flexibility
Standing side stretch 20 sec
Standing chest stretch 20 sec
Standing shoulder stretch 20 sec
Standing calf stretch 20 sec
Standing hamstring stretch 20 sec
Standing quad stretch 20 sec

Day 2

30 mins cumulative of walking or stationary bike

RPE 4-5/10

* 10 min increments if needed, while encouraging a lower intensity

Warm-Up

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5 min walk

10 modified squats

10 side steps

10 arm circles each direction

Workout

Bodyweight chair sit to stand x 15

Wall pushups x 15

Weighted bicep curl x 15

Weighted overhead press (neutral grip) x 15

Weighted tricep extension x15

Bodyweight alt. side lunges (limited ROM) x 15

Chair sit ups x 15

2 rounds

Cooldown/Flexibility

Standing side stretch 20 sec

Standing chest stretch 20 sec

Standing shoulder stretch 20 sec

Standing calf stretch 20 sec

Standing hamstring stretch 20 sec

Standing quad stretch 20 sec

Day 4

30 mins cumulative of walking or stationary bike

RPE 4-5/10

* 10 min increments if needed, while encouraging a lower intensity

Day 5

Rest day

Day 6

30 mins cumulative of walking or stationary bike

RPE 4-5/10

* 10 min increments if needed, while encouraging a lower intensity

Day 7

Rest day

Block 2 (Weeks 5-8)

Our goal this block of four weeks is to encourage heavier weight choices, and by doing so to reduce rep count slightly and increase the duration of cardiovascular exercise while keeping the intensity low.

Increase the aerobic exercise to 45 minutes of duration, which can be cumulative, while starting to encourage her to do it in larger increments or all at once. Add an additional day of aerobic exercise if tolerated.

Day 1

Warm-Up

5 min walk

10 modified squats

10 side steps

10 arm circles each direction

Workout

Weighted squats x 12

Weighted chest press x 12

Weighted bicep curl x 12

Weighted lateral raise x 12

Overhead tricep extension x 12

Split stance lunge (weights optional) x 12 each side

Chair sit ups x 12

Chair oblique twist x 12 total (6 each)

2 rounds

Cooldown/Flexibility

Standing side stretch 20 sec

Standing chest stretch 20 sec

Standing shoulder stretch 20 sec

Standing calf stretch 20 sec

Standing hamstring stretch 20 sec

Standing quad stretch 20 sec

Day 2

45 mins cumulative of walking or stationary bike

RPE 5/10

* 10 min increments or more if needed. Keeping intensity low, but focus on increasing duration

Day 3

Warm-Up

5 min walk

10 modified squats

10 side steps

10 arm circles each direction

Workout

Weighted squats x 12

Weighted chest press x 12

Weighted bicep curl x 12

Weighted lateral raise x 12

Overhead tricep extension x 12

Split stance lunge (weights optional) x 12 each side

Chair sit ups x 12

Chair oblique twist x 12 total (6 each)

2 rounds

Cooldown/Flexibility

Standing side stretch 20 sec

Standing chest stretch 20 sec

Standing shoulder stretch 20 sec

Standing calf stretch 20 sec

Standing hamstring stretch 20 sec

Standing quad stretch 20 sec

Day 4

45 mins cumulative of walking or stationary bike

RPE 5/10

* 10 min increments or more if needed. Keeping intensity low, but focus on increasing duration

Day 5

OPTIONAL:

30 minutes walking or stationary bike

RPE 5/10

Day 6

45 mins cumulative of walking or stationary bike

RPE 5/10

* 10 min increments or more if needed. Keeping intensity low, but focus on increasing duration

Day 7

Rest Day

Block 3 (Weeks 9-12)

Our goal for the third block of four weeks is to maintain the strength set while doing more traditional weight exercises. We also want to pair together muscle groups while still encouraging her to increase weight choices as tolerated, depending on the exercise. Add a set and reduce rep count again to build strength and muscular hypertrophy. Since we established longer duration aerobic exercise, let's start encouraging a higher level of intensity to maximize the benefit.

On her aerobic days give her flexibility to do up to 60 minutes, or more if tolerated and supported by caloric intake, while keeping her extra day lower in duration and intensity. Preventing injury and overuse is important to keep this long-term habit.

Day 1

Warm-Up

5 min walk

10 modified squats

10 side steps

10 arm circles each direction

Workout

Weighted sumo squats x 10

Weighted split stance lunge x 10 each

3 rounds

Weighted chest press x 10

Supine tricep extension (skull crusher) x 10

3 rounds

Weighted bicep curls x 10

Weighted overhead press x 10

3 rounds

Chair sit ups x 10

Chair oblique twist x 10 total (5 each)

Option to bring to ground if able

3 rounds

Cooldown/Flexibility

Standing side stretch 20 sec

Standing chest stretch 20 sec

Standing shoulder stretch 20 sec

Standing calf stretch 20 sec

Standing hamstring stretch 20 sec

Standing quad stretch 20 sec

Day 2

45-60 mins cumulative of walking or stationary bike

RPE 6-7/10

* Intensity increasing, encourage to do in longer increments or all at once

Day 3

Warm-Up
5 min walk
10 modified squats
10 side steps
10 arm circles each direction
Workout
Weighted sumo squats x 10
Weighted split stance lunge x 10 each
3 rounds
Weighted chest press x 10
Supine tricep extension (skull crusher) x 10
3 rounds
Weighted bicep curls x 10
Weighted overhead press x 10
3 rounds
Chair sit ups x 10
Chair oblique twist x 10 total (5 each)
Option to bring to ground if able
3 rounds
Cooldown/Flexibility
Standing side stretch 20 sec
Standing chest stretch 20 sec
Standing shoulder stretch 20 sec
Standing calf stretch 20 sec
Standing hamstring stretch 20 sec
Standing quad stretch 20 sec

Day 4

45-60 mins cumulative of walking or stationary bike
RPE 6-7/10

* Intensity increasing, encourage to do in longer increments or all at once

Day 5

OPTIONAL:
30 minutes walking or stationary bike
RPE 5/10

Day 6

45-60 mins cumulative of walking or stationary bike
RPE 6-7/10

* Intensity increasing, encourage to do in longer increments or all at once

Day 7

Rest Day

Special Considerations

Special considerations for Mrs. R. are her blood pressure, which is controlled by medication, and prediabetes. Exercise can reduce blood pressure so it would be wise to make sure that her blood pressure is checked before and after exercise if she is exercising in the clinic.

She is taking Metformin, which puts her at risk for post-exercise hypoglycemia. Another precaution is ensuring exercise is not performed on an empty stomach. Ideally, her blood glucose levels should be checked after exercise as needed if she becomes symptomatic of hypoglycemia.

The other main consideration is monitoring her energy levels. Since she is working with a dietician to reduce calorie intake, she could suffer from a lack of energy and reduction in muscle mass if she's increasing exercise and reducing calories too quickly. If energy levels drop significantly or recovery time is increased drastically, you must communicate that with the dietician to produce a plan to either increase calorie intake or reduce calorie expenditure.

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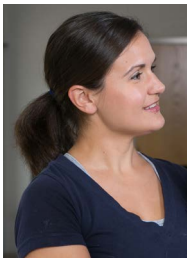

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