**Case Study**

Harry is a 67-year old male who completed radiation treatment for stage IIA prostate cancer three months ago. His lingering side effects include muscle weakness, fatigue, and depression. He has arthritis in his shoulders, and he has been diagnosed with hypertension and depression. Harry lives alone, has a high school education, and has not regularly exercised for more than 20 years.

Objective measures:

Height: 5 ft. 9 in. (1.75 cm)

Weight: 185 lb. (83.9 kg)

BMI: 27.5 kg/m2

HR: 78 bpm

BP: 130/86 mmHg

Motivation to exercise: 6/10 on a scale of 1-10 (10 being the most motivated)

Medications:

1. Lisinopril for hypertension
2. Sertraline for depression
3. Ibuprofen for should pain (as needed)

Strength Tests:

1-RM Leg press: 125 lbs.

5-RM Chest press: 60 lbs.

5-RM Shoulder press: 30 lbs.

10-RM Bicep curl: 10 lbs.

**Note**: Harry did not have surgery and does not have any limitations with his lower body, thus, a 1-RM was completed on the leg press. Because Harry has arthritis in his shoulders, a 5-RM was done with the chest press and shoulder press for safety. The 10-RM was done with the bicep curl, as a 1-RM is not recommended for single joint exercises.

Exercise Goals:

1. Increase muscular strength
2. Increase muscular endurance
3. Improve mood
4. Improve ability to perform Activities of Daily Living

Analysis:

Harry is deconditioned, but he has no major contraindications that would prevent him from safely beginning a resistance training program. Lisinopril (an angiotensin converting enzyme inhibitor) and sertraline (a selective serotonin reuptake inhibitor) typically do not affect exercise capacity, but Harry’s blood pressure should be monitored before and after exercise as a general precaution. Engaging in conversation with Harry will help to determine his current mood state and likely responsiveness to direction during exercise. His heart rate and level of fatigue should be assessed prior to, during, and after exercise.

Plan:

Harry is rather weak and has very poor form when trying to complete the prescribed exercises. As such, a considerable amount of time needs to be devoted to teaching him form without weight (and then using a light amount of weight). Once his form improves, the weight can be adjusted and increased in response to his increases in strength. Harry will likely gain strength quickly, thus it will be important to regularly assess these changes in order to progress him properly. After the baseline assessment, another assessment at week 3 and 6 is recommended. Future assessments can then be done on a consistent basis and as needed (e.g., when he is able to complete the final 2-3 reps in a set without much effort), which will ultimately provide him with a more refined and challenging exercise prescription.

Harry should start with a full-body routine twice per week. After a 5-10 minute low-to-moderate intensity aerobic warm-up, each body part should be exercised (i.e., legs, chest, back, shoulders, arms, abdomen), with at least one set of 10-20 reps (i.e., corresponding to 50-75% of the 1-RM). This can then be increased to 2+ sets per exercise/body part, and the reps can be adjusted in accordance with the total weight used for that exercise (i.e., 10-12, 8-10). It will be important to regularly change the specific exercises Harry does to ensure there is variation in his routine. A 10-minute low intensity aerobic cool-down with some stretching is also recommended. Overall, his progression should be determined by his responses to the prescribed exercise routine (see an example below).

Harry’s exercise sessions can eventually be increased to 3-4 times per week based on his adherence to the program and the progress he makes. Importantly, his full-body routine would need to be adjusted in response to more training sessions per week. For example, if he is completing four sessions per week, he should progress to an increased intensity (i.e., greater sets, reps, load, or combination of these) and split-body program, which will allow for a wider variety of exercises and a 2+ day break between exercising the same body part.

Example Resistance Training Routine:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Exercise** | **Weeks 1-3** | | | **Weeks 4-6** | | | **Weeks 7-9** | | | **Weeks 10-12** | | |
|  | Sets | Reps | Intensity | Sets | Reps | Intensity | Sets | Reps | Intensity | Sets | Reps | Intensity |
| Leg press | 1-2 | 10-15 | 50% of 1-RM | 2 | 10-12 | 60% of 1-RM | 2-3 | 8-12 | 70% of 1-RM | 3 | 8-10 | 80% of 1-RM |
| Lunges | 1-2 | 10-15 | 80% of 10-RM | 2 | 10-12 | 90% of 10-RM | 2-3 | 8-12 | 100% of 10-RM | 3 | 8-10 | 110% of 10-RM |
| Chest press | 1-2 | 10-15 | 40% of 5-RM | 2 | 10-12 | 50% of 5-RM | 2-3 | 8-12 | 60% of 5-RM | 3 | 8-10 | 70% of 5-RM |
| Seated rows | 1-2 | 10-15 | 40% of 5-RM | 2 | 10-12 | 50% of 5-RM | 2-3 | 8-12 | 60% of 5-RM | 3 | 8-10 | 70% of 5-RM |
| Shoulder press | 1-2 | 10-15 | 40% of 5-RM | 2 | 10-12 | 50% of 5-RM | 2-3 | 8-12 | 60% of 5-RM | 3 | 8-10 | 70% of 5-RM |
| Tricep pushdowns | 1-2 | 10-15 | 90% of 10-RM | 2 | 10-12 | 100% of 10-RM | 2-3 | 8-12 | 110% of 10-RM | 3 | 8-10 | 120% of 10-RM |
| Bicep curls | 1-2 | 10-15 | 90% of 10-RM | 2 | 10-12 | 100% of 10-RM | 2-3 | 8-12 | 110% of 10-RM | 3 | 8-10 | 120% of 10-RM |
| Sit-ups | 1-2 | 20 | N/A | 2 | 20+ | N/A | 2-3 | 20+ | N/A | 3 | 20+ | N/A |

Potential Outcomes After 12-Weeks:

Weight: 182 lb. (82.7 kg)

BMI: 26.9 kg/m2

HR: 77 bpm

BP: 122/84 mmHg

Motivation to exercise: 8/10

No major changes to medications.

1-RM Leg press: 150 lbs.

5-RM Chest press: 75 lbs.

5-RM Shoulder press: 40 lbs.

10-RM Bicep curl: 20 lbs.

Harry has reached his goals of increasing muscular strength and endurance. He does not feel as fatigued as he once did, and his mood is starting to improve. He is able to complete his ADLs with greater ease. All of these factors have now given him more motivation to keep exercising on his own.