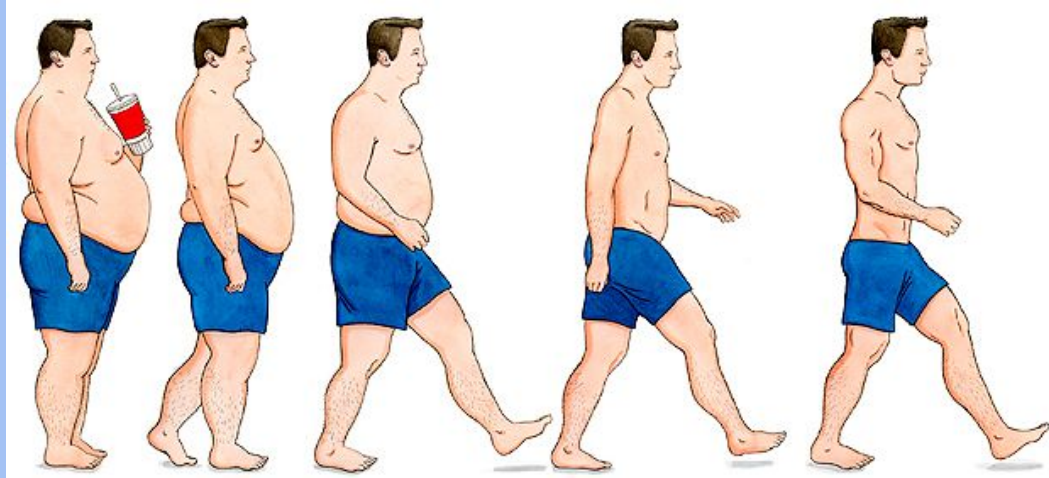




Exercise Prescription Case Study



Mr. O Reight (Obese Male, Age 50)



Presented by:

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To Start of... What is Obesity?

- Overweight is a condition involving excess fat accumulation that may impair health.
- Obesity is a chronic, multifactorial disease that increases risk of serious health conditions.



Obesity health
problem



Body Mass
Index



High blood
pressure



today will weigh their options
in hopes of bringing down



NEW THIS MORNING

CDC: 40% OF AMERICANS OBESE

LAWMAKERS EXAMINE COST OF WEIGHT-LOSS DRUGS

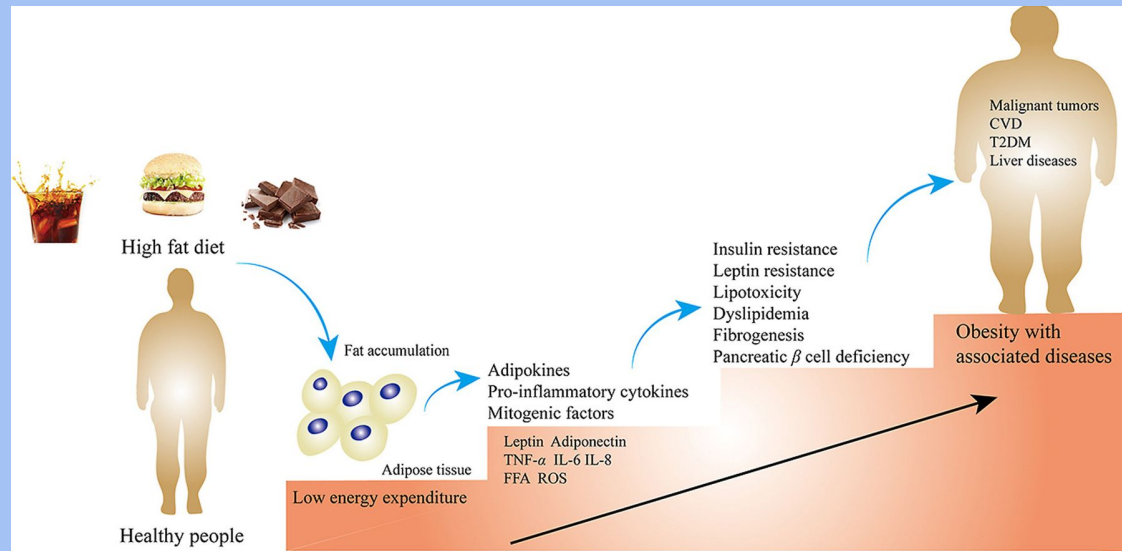
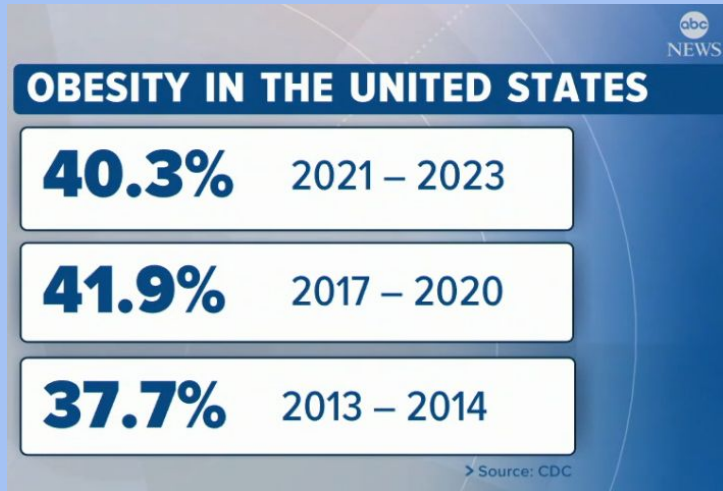


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Obesity Facts



Unhealthy lifestyle → Fat accumulation → Inflammation → Chronic disease



*Mr. O Profile: Overview

Age: 50 **Height:** 5'9" (175 cm) **Weight:** 210 lbs (95.3 kg) **% Body Fat:** 30%
BMI: 31.0

Waist Circumference: 47 inches

→ *Confirms clinical obesity*

Cardiometabolic Health:

- Resting BP: 128/80 mmHg → = elevated range = Stage 1 Hypertension
- Resting HR: 84 bpm (Higher End)
- VO₂max: 30.9 ml/kg/min → Low fitness level
- Cholesterol: TC = 198, LDL = 129, HDL = 40
- Fasting Glucose: 98 mg/dL (pre-diabetic range)

Lifestyle & Behavior:

- Lifestyle: Bagel + coffee breakfast, Subway lunch, beer + ice cream several days a week + no added salt + non-smoker
- Occupation: Customer service representative.
- Physical Activity: 30-minute weekend walks with wife



Why Does Mr. O Need to Start Exercising Now?



- Cardiorespiratory fitness (“fair” ACSM)
- BP (128/80 mmHg)
- HDL cholesterol (40 mg/dL)
- Borderline fasting glucose (98 mg/dL)
- Family history of Type 2 diabetes
- Sedentary lifestyle.

		Disease Risk Relative to Normal Weight and Waist Circumference	
		Men ≤102 cm Women ≤88 cm	Men >102 cm Women >88 cm
Underweight	<18.5	—	—
Normal	18.5–24.9	—	—
Overweight	25.0–29.9	Increased	High
Obesity, class			
I	30.0–34.9	High	Very high
II	35.0–39.9	Very high	Very high
III	≥40.0	Extremely high	Extremely high

$$\text{BMI} = \text{BW(kg)} / \text{Height (m)}^2$$

OBESITY

(BMI = 31.0, 30% body fat, 47" waist)




- 2 Type 2 Diabetes
- Cardiovascular Disease
- Hypertension
- Low HDL Cholesterol
- Fatty Liver Disease
- Sleep Apnea

(CDC, 2024, NIH, 2022)


3–5% weight loss = clinical benefit (CDC, 2024)




↓ Visceral fat &
waist circumference


↑ VO₂max
& energy


↓ Blood pressure
& fasting glucose


↑ Mood, motivation,
& daily function

Goals: Lose weight, feel better
Improve well-being



Best Strategy:



Combination
of diet and PA greater
long-lasting outcomes



Fat Mass Insight:



AT better than RT.



RT+AT ≠ better than AT alone



Prevention of weight regain:

Requires at least 250 minutes/week of
moderate-to-vigorous exercise

What Risk Factors does Mr. O have?



Risk Factor

Meets Criteria?

Age ≥ 45

Yes (Mr. O is 50)

Physical inactivity (<150 min/week)

Yes (just 30 min 2x/week walks)

Obesity (BMI ≥ 30 or waist > 40 ")

Yes (BMI = 31.0, Waist = 47 in)

Family history

Mother has type 2 diabetes

Lipids

HDL: 40

Blood pressure $\geq 130/80$ mm Hg

SBP: 128 mmHg: Elevated
DBP: 80 mmHg: Stage 1
Hypertension

Smoking

No

Blood glucose ≥ 100 mg/dL

No (FG = 98 mg/dL)

➡ Total = 6 risk factors

➡ ACSM: ≥ 2 risk factors = higher risk classification



Does he need medical clearance before starting an exercise program?

Medical
Clearance***
Recommended

- Does not exercise regularly and sedentary lifestyle
- No signs or symptoms of cardiovascular, metabolic, or renal disease
- Not diagnosed with any chronic disease
- Has multiple CVD risk factors (age, inactivity, obesity, family history)



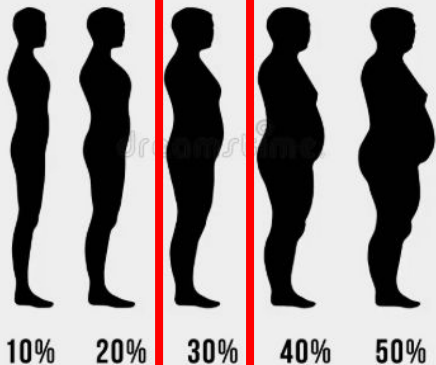
Result: **Clearance Required**

Presently,

Mr. O's weight is **210** lbs
and his body fat % is **30%**



BODY FAT PERCENTAGE MEN



Ideal Weight

Calculation (Using % Body Fat)

$$\begin{aligned}\text{Fat-Free Mass FFM} &= \text{Body weight} \times ([100 - \text{Body fat percentage}] / 100) \\ &= 210 \times ([100 - 30] / 100) = \mathbf{147} \text{ lbs.}\end{aligned}$$

Goal Body Weight (GBW)

$$\begin{aligned}\text{at 25\% Body Fat:} &= \text{Fat-free weight} / (1 - [\text{Goal body fat \%} / 100]) \\ &= \mathbf{147} / (1 - [25 / 100]) = \mathbf{196} \text{ lbs.}\end{aligned}$$

Our Goal is for him to lose 14 lb within 3 to 6 months of starting the program. Which is equivalent to a 6.7% Reduction (Recommended!)

CDC Recommends a target of 3% to 10% loss over 3-6 months; a reduction of 1 to 2 pounds per week.
Even just 10.5 Pounds → (5%) of weight loss can already start improving his health!

FITT Guidelines:

Warm-up: 5 minutes treadmill + dynamic mobility

Cool-down: 5 minutes stretching

Progression Rule: If RPE drops below the lower estimated value for the week, and reps are completed comfortably, increase resistance (by ~5 lbs).

Deload: lighter week on Week 9.

Core Focus: To include 1–2 core and/or Stability exercises per session.

Progression of Exercise Prescription - 15 Weeks

	Week 1	Week 2	Weeks 3–8	Week 9	Weeks 10–12	Weeks 13–15
Phase	Preparatory	Preparatory	Training	Deload	Training	Training
RPE (Effort 1–10)	4 - 5	4 - 5	6 –7	4 - 5	6 –7	6 - 8
Volume (Sets)	2	3	3	2	3	3
Intensity (Reps)	8 - 10	8 - 12	10 - 12	8 - 10	10 - 12	8 - 12
Rest Between Sets (min)	1.5–2	1–1.5	1	1.5 - 2	1	1
Frequency	2x/week RT 3x/week AT 1x/ Flexibility	2x/week RT 3x/week AT 1x/ Flexibility	2x/week RT 3x/week AT 1x/ Flexibility	2x/week RT 3x/week AT 1x/ Flexibility	2x/week RT 3x/week AT 1x/ Flexibility	2x/week RT 3x/week AT 1x/ Flexibility
Progression Criteria	N/A	When 3 sets × 12 reps & RPE < 4	When 3 sets × 12 reps & RPE < 6	NA	When 3 sets × 12 reps & RPE < 6	When 3 sets × 12 reps & RPE < 7

Weekly Schedule

Saturday/Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
Recreational Walk 30 Minutes	RT / Full Body AE / Cardio & Core	Rest	AE Cardio Flexibility & Balance	RT / Full Body AE / Cardio & Core	Rest

Exercise Prescription for Preparatory Phase Week 1 - 2 (RT/Full Body, AE, Balance and Core): Monday & Thursday

1. Standing Dumbbell Shoulder Press (V. Push)



Week 1: RPE 4-5 | Sets 2 | Reps 8
Week 2: RPE 4-5 | Sets 3 | Reps 10

2. Lat Pull-down (V. Pull): back



Week 1: RPE 4-5 | Sets 2 | Reps 8
Week 2: RPE 4-5 | Sets 3 | Reps 10

3. Chest Press Machine/H. Push: (Chest, shoulder, triceps)



Week 1: RPE 4-5 | Sets 2 | Reps 8
Week 2: RPE 4-5 | Sets 3 | Reps 10

4. Bicep Curl Machine/H. Pu



Week 1: RPE 4-5 | Sets 2 | Reps 8
Week 2: RPE 4-5 | Sets 3 | Reps 10

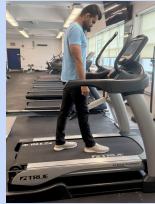
5. Leg Press (quadriceps, hamstrings, glutes & Hip)



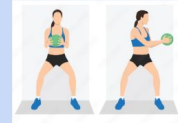
Week 1: RPE 4-5 | Sets 2 | Reps 8
Week 2: RPE 4-5 | Sets 3 | Reps 10

8. AE on Treadmill

RPE: 4-5
Grade: 0
Time: 20 mins
Speed: slow/Brisk Walking



Core: Wall Sit Rotation



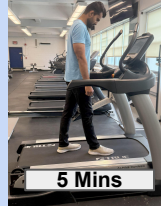
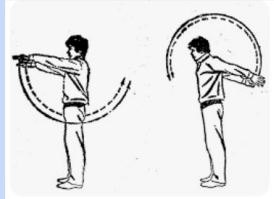
Sets: 2 Reps: 8

Core: Plank



Set: 1 Time: 15 Seconds

Warm Up: (Dynamic)



Cool down: (Static Stretching)



Exercise Prescription for Preparatory Phase: Week 1-2 (AE, Flexibility, Balance): Wednesday

1: AE on Treadmill

RPE: 5-6
Grade: 0
Time: 30 mins
Speed: Slow/Brisk Walking



2. Balance/Stability: Step-ups



Sets 2 | Rep 10

3. Balance/Stability: Stepping Over Obstacles



Reps: 15 back and forth

4 Balance/Stability: Side Stepping Over Obstacles



Reps: 15 back and forth

Balance: One Leg Stand



Time: 5 - 10 seconds

Static stretch



Proprioceptive neuromuscular facilitation (PNF)



FIGURE 14.6 Passive prestretch of hamstrings during contract-relax PNF stretch.



FIGURE 14.7 Concentric action of hip extensors during contract-relax PNF stretch.

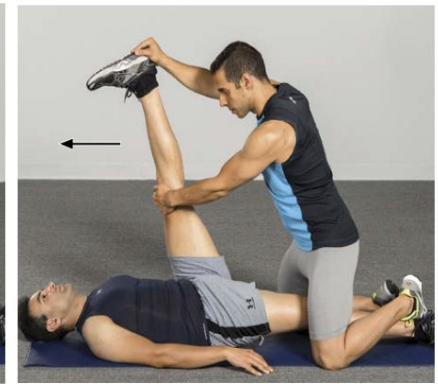


FIGURE 14.8 Increased ROM during passive stretch of contract-relax PNF stretch.

Source: Haff & Triplett (Eds.), 2016, Essentials of Strength Training and Conditioning, 4th ed., Human Kinetics.

Alternative Exercises

Rope Triceps Pushdown/V. Push



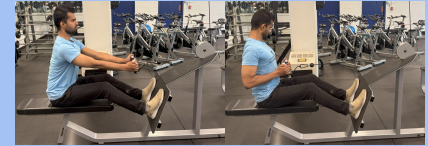
Lying Bench Press/H. Push (Chest, shoulder, triceps)



Dumbbell Lateral Raises/V.Push: lateral deltoid/shoulders



Seated Rows/H. Pull: (Lats, Rhomboids, Trapezius)



Lunges (quadriceps, hamstrings, glutes)



Squats: quadriceps, hamstrings, glutes & Hips



Seated Leg Curl (knee/Hamstrings)



Leg Extension/V.Push: (knee)



Balance/Stability: Standing on flat side of dome



Deadlift/V. Pull: (lower back, Hamstrings and glutes)



4. Balance/Stability: Step-ups (Progression)



Core: Rotation Leg Raises



Core/Rotation: Twist Crunch



Any contraindications? (or limitations)



No absolute contraindications, but monitor:

- **Joint Stress:** Avoid high-impact activities due to excess joint load.
→ running, jumping
- **BP (128/80):** Monitor blood pressure
→ avoid sudden intensity spikes.
- **Low fitness level:** Start with low-to-moderate intensity; progress gradually.
- **Injury Risk:** Prioritize warm-ups, proper form, and use of machines.
- **Diet/Alcohol:** Encourage moderation in alcohol and dessert intake to support recovery.

Limitations:

“Exercise feels difficult”:

Start light; focus on progress, not perfection.

“feel uncomfortable”:

Suggest personal trainer or partner-based workouts.

“Exercise makes me hungrier”:

Educate on balanced meals.

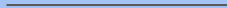
“Hard to stay consistent”:

Use a flexible 3x/week plan with tracking tools.

Conclusion

"Given Mr. O's diabetic risk, our 15-week plan is more than just exercise"

It's a crucial first step toward prevention, and a reminder to us, as future professionals exercise science, of the power of personalized care.



**Thanks
Dr.B! :)**

Do you have any questions?