If you don’t use it, you lose it!

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[X] I have no potential conflict of interest to report

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Does structured physical activity post metabolic and bariatric surgery result in improved retention of lean body mass in the longer term?

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Overview

- Defining exercise Vs Physical activity
- Exercise guidelines and recommendations
- Exercise pre-bariatric surgery
- Exercise post-bariatric surgery
- Take home messages

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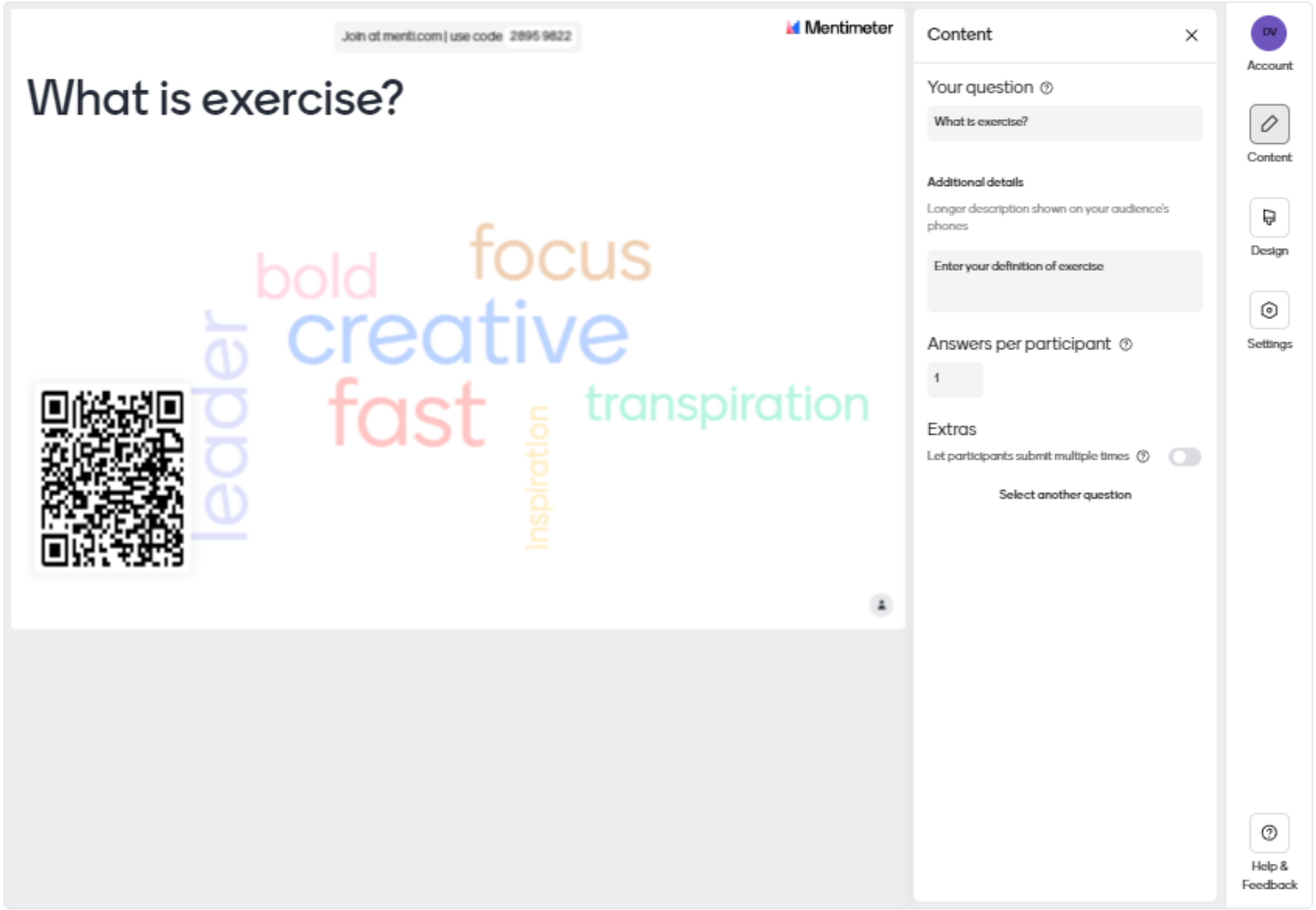
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Definitions

Physical activity

Any bodily movement produced by skeletal muscles that requires energy expenditure. Physical activity refers to all movement including during leisure time, for transport to get to and from places, or as part of a person's work or domestic activities.

(WHO, 2024)

Definitions

Exercise

Is a subcategory of physical activity that is planned, structured, repetitive, and purposefully focused on improvement or maintenance of one or more components of physical fitness.

(Dasso, 2018)

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Mentimeter

How many minutes of physical activity are recommended per week?

For moderate intensity

For vigorous intensity

Less

More

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Current guidelines

Adults should do at least 150–300 minutes of moderate-intensity aerobic physical activity;

OR

at least 75–150 minutes of vigorous-intensity aerobic physical activity; or an equivalent combination of moderate- and vigorous-intensity activity throughout the week, for substantial health benefits.

AND

Adults should also do muscle-strengthening activities at moderate or greater intensity that involve all major muscle groups on 2 or more days a week, as these provide additional health benefits.

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(WHO, 2020)

Physical activity statistics

- Women are less active than men.
- After 60 years of age physical inactivity levels increase in both men and women.
- 81% of adolescents (aged 11–17 years) are physically inactive.
- Adolescent girls are less active than adolescent boys.

(WHO, 2024)

Exercise and obesity

- Clinical practice guidelines suggest diet and exercise as first-line treatment strategies for overweight and obesity.

- There is some evidence that adaptations to exercise could be blunted in obesity.

(Miller et al., 2020)

Exercise prior to surgery

- Exercise in addition to dietary intervention does not significantly improve lean muscle mass.
- Most research uses only aerobic exercise

Exercise following surgery

- 2010 – Livhits et al; exercise post-surgery results in 4% greater weight loss
- 2011 – Egberts et al; 3.6kg greater weight loss for exercisers.
- 2015 – Pouwels et al; Exercise is beneficial for several outcomes
- 2018 – Coen et al; Neither resistance or combined training alters FFM changes

TABLE 3. Summary of findings of meta-analyses

Outcome	*N* studies	MD [95% CI] or SMD [95% CI]	*P* value	I^2 - Tau^2 (*P* value)	[95% PI]
Effect observed after the intervention					
Change in body weight	14	MD: −1.8 [−3.2; −0.4] kg	0.01	35% - 2.28 (0.09)	[−5.4; 1.8]
Change in fat mass	9	MD: −2.1 [−3.7; −0.5] kg	0.01	50% - 2.76 (0.04)	
Change in lean body mass	11	MD: 0.7 [−0.2; 1.6] kg	0.13	45% - 0.92 (0.05)	[−1.7; 3.1]
Change in bone mineral density	3	SMD: 0.44 [0.21; 0.67]	0.0002	0% - 0.0 (0.40)	
Change in VO_2max	8	SMD: 0.70 [0.35; 1.10]	<0.0001	42% - 0.10 (0.10)	
Change in muscle strength	9	SMD: 0.82 [0.48; 1.16]	<0.0001	42% - 0.11 (0.09)	
Change in walking distance	6	SMD: 1.46 [0.27; 2.66]	0.02	90% - 1.98 (<0.001)	
Systolic blood pressure	4	MD: −4.2 [−9.3; 1.0] mmHg	0.12	47% - 12.7 (0.13)	

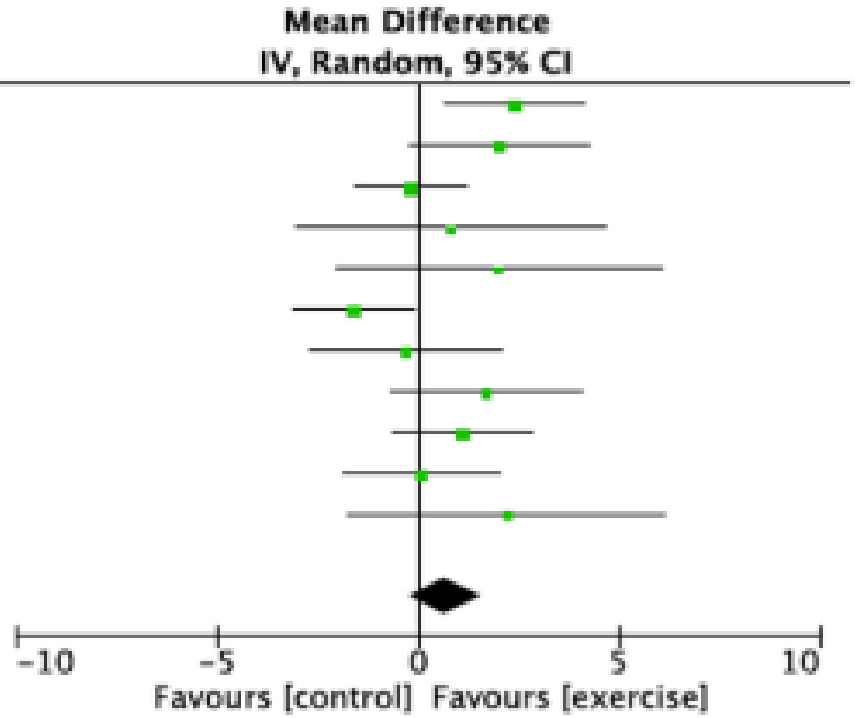
Exercise following surgery

RYGB

(C) Change in lean body mass (in kg)

Study or Subgroup	Weight	Mean Difference IV, Random, 95% CI
Campanha-Versiani	11.8%	2.40 [0.66, 4.14]
Castello	9.1%	2.00 [-0.23, 4.23]
Coen (a)	14.2%	-0.20 [-1.59, 1.19]
Hassannejad (a)	4.2%	0.80 [-3.07, 4.67]
Hassannejad (b)	3.9%	2.00 [-2.05, 6.05]
Herring	13.4%	-1.60 [-3.10, -0.10]
Huck	8.4%	-0.30 [-2.68, 2.08]
Marchesi	8.4%	1.70 [-0.68, 4.08]
Oppert	11.8%	1.10 [-0.64, 2.84]
Shah	10.6%	0.10 [-1.84, 2.04]
Stegen	4.1%	2.20 [-1.72, 6.12]
Total (95% CI)	**100.0%**	**0.68 [-0.20, 1.56]**

Heterogeneity: $Tau^2 = 0.92$; $Chi^2 = 18.12$, df = 10 (P = 0.05); $I^2 = 45\%$
Test for overall effect: Z = 1.52 (P = 0.13)
95% Prediction Intervals: (-1.7, 3.1)



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Take home messages

- The evidence for the effects of exercise on FFM after bariatric surgery is limited
- A trend for prescribing aerobic rather than resistance training is evident
- Resistance training prescription is likely inadequate to have significant effects on FFM
- Exercise is more effective when initiated in the first post-surgical year
- Surgical procedure type may influence the effectiveness of exercise interventions

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