

BRIDGE-PROJECT:

Bridging **R**esearch & **I**nstitutes through **D**igitally **G**uided **E**xercise
Prescriptions with **R**eliable **O**utcomes by **J**oining **E**ducation &
Community with **T**echnology

November 20th, 2024

Matthew Kampert DO, MS, ACSM-CEP

Cleveland Clinic Staff Physician: Sports & Exercise Medicine

Cleveland Clinic Staff Physician: Endocrinology & Metabolism Institute

Director of Musculoskeletal Sciences for Cleveland Clinic Lerner Medical College



Faculty Disclosure

Matthew Kampert does not have any relevant financial relationships with ineligible companies to disclose in relation to this activity.



Financial Independence in Retirement

Invest Early
&
Maintain Gains



Show of Hands: Who has Started Investing for Retirement?

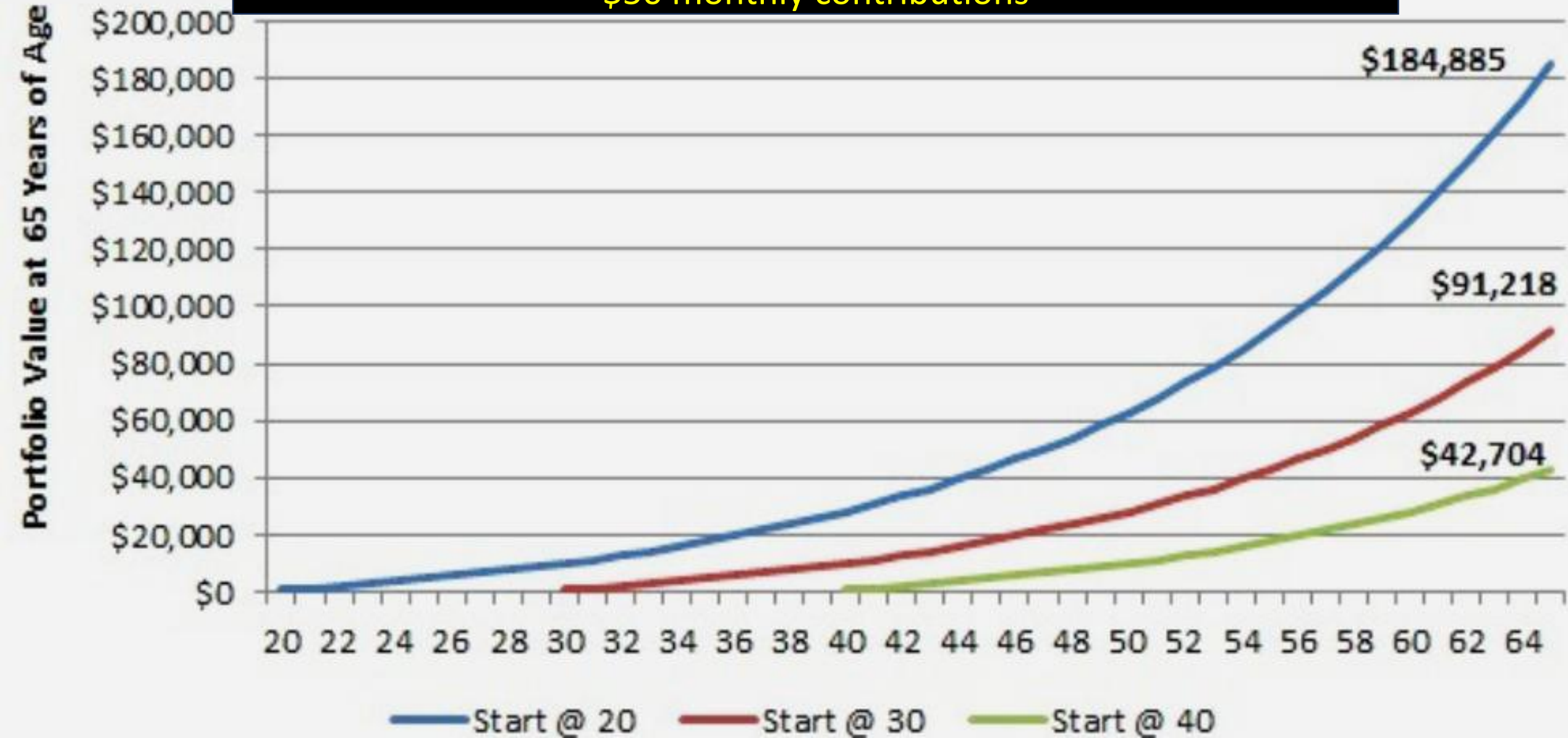


Finance is a Factor in Retirement Activities



Investing: The Benefit of Starting Early

Assumes 8% growth compounded annually at the end of the year with \$50 monthly contributions



Functional Independence in Retirement

Train Early
&
Maintain Gainz



Show of Hands: Who Started Training for Retirement?



Fitness is a Factor in Retirement Activities



Rate of Return Varies with Age

Getting Started @ Age 20



Getting Started @ Age 60





EXERCISE INTENSITY (METs) FOR DAILY LIFE ACTIVITIES

from the Compendium of Physical Activities



Light exercise
General cleaning & straightening up 2.5



Washing dishes, clearing the table 2.5



Walking 2.0 mph (strolling) 2.8



Moderate exercise
Sweeping, vacuuming 3.3



Scrubbing the floor 3.8



Gardening, weeding 4.0



Moderate exercise
Multiple household tasks at once with vigorous effort 4.3



Walking 3.0 mph 3.5



Walking 4.0 mph* 5.0



Walking with a light (15 lb) load 5.0



Walking 3.0 mph at 3-5% grade (uphill) 5.3



Mowing the lawn 5.5



Moving furniture and carrying boxes 5.8

Vigorous exercise

Climbing stairs



8.0

**Energy ratings are based on METs (metabolic equivalent). Light exercise is less than 3.0 METs. Moderate exercise is 3.0-5.9 METs. Vigorous exercise is 6.0 METs and above.*

Cardiorespiratory Fitness (VO_2max)

Predictors of mortality ¹²

- Smoking
- High Blood Pressure
- Diabetes
- High Cholesterol
- **Cardiorespiratory Fitness**

VO_2max decreases at a rate of approximately 10% per decade, this decline accelerates after age 60 ¹³

1-2 MET increase associated with 10-30% fewer cardiac events ¹²



Muscle Mass and Muscular Strength

Research comparing different age groups has revealed rate of muscle mass decline ¹⁴

- Females 3.7% per decade
- Males 4.7% per decade

A study tracking healthy older adults found a 3x greater loss in strength compared to muscle mass over ¹⁴

- Females 2.6% per year
- Males 3.6% per year

Compared to adults who report no resistance training, adults who participate in resistance training have ¹⁵

- 15% lower risk of all-cause mortality
- 17% lower risk of cardiovascular disease



Decide How You Want to Age

Aging with Exercise



Aging without Exercise



Osteobesity

Case Study



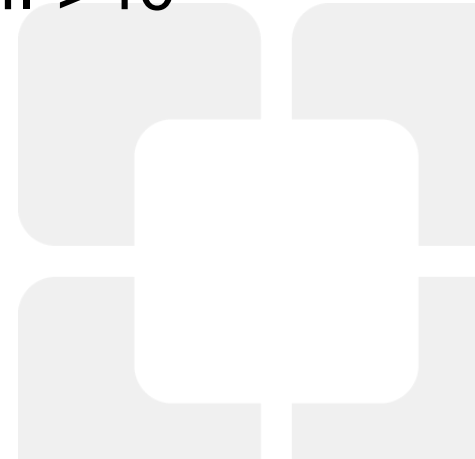
Osteobesity

Currently,

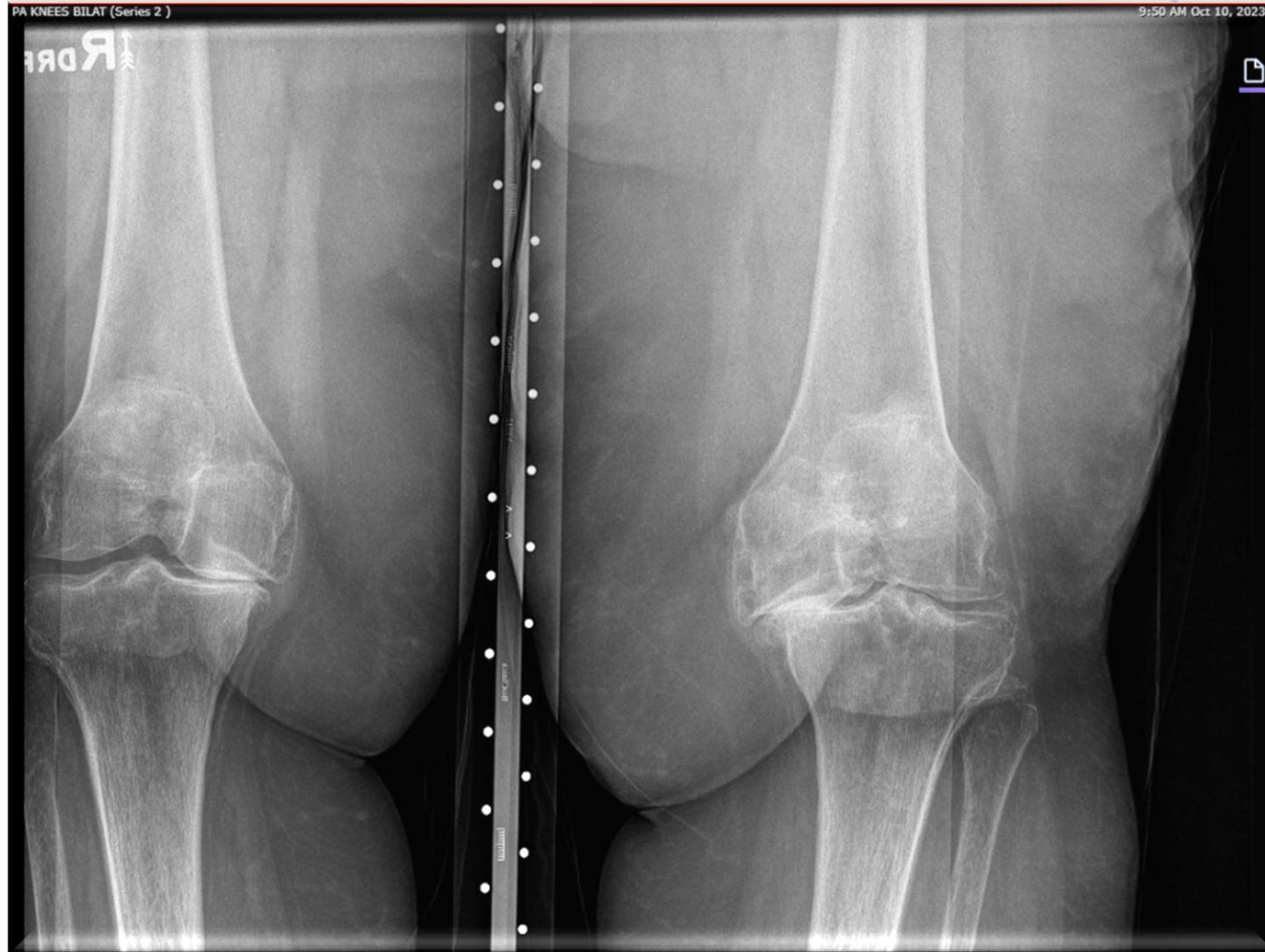
- Prevalence of childhood obesity is 20% and affects 14.7 million youth¹
- American Academy of Orthopaedic Surgeons has identified a threshold for elective safe surgery as a BMI < 40²

In the US by 2030,

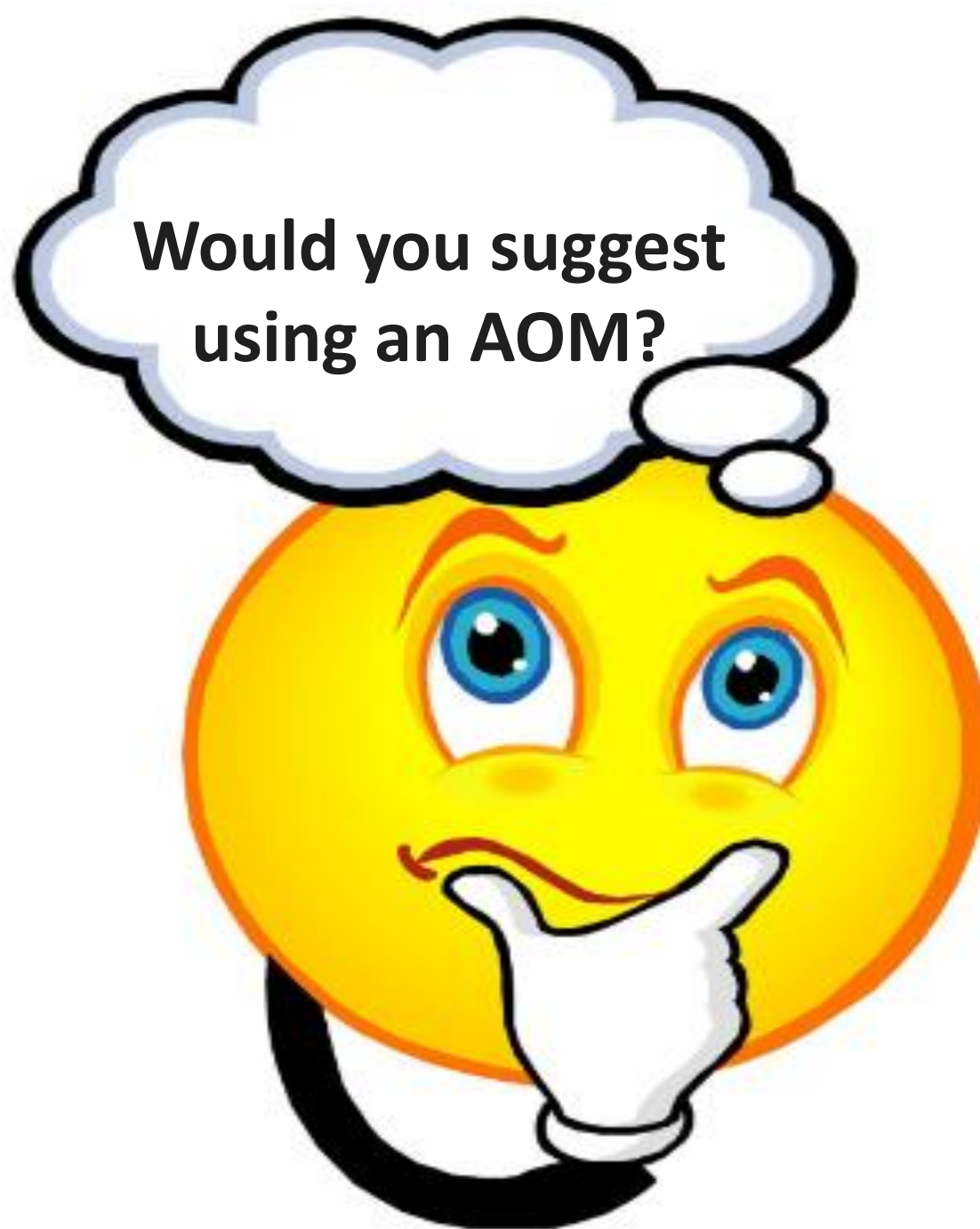
- 48% of adults will have obesity, and 24% projected to have a BMI >40³
- 3.48 million TKAs will be performed annually⁴



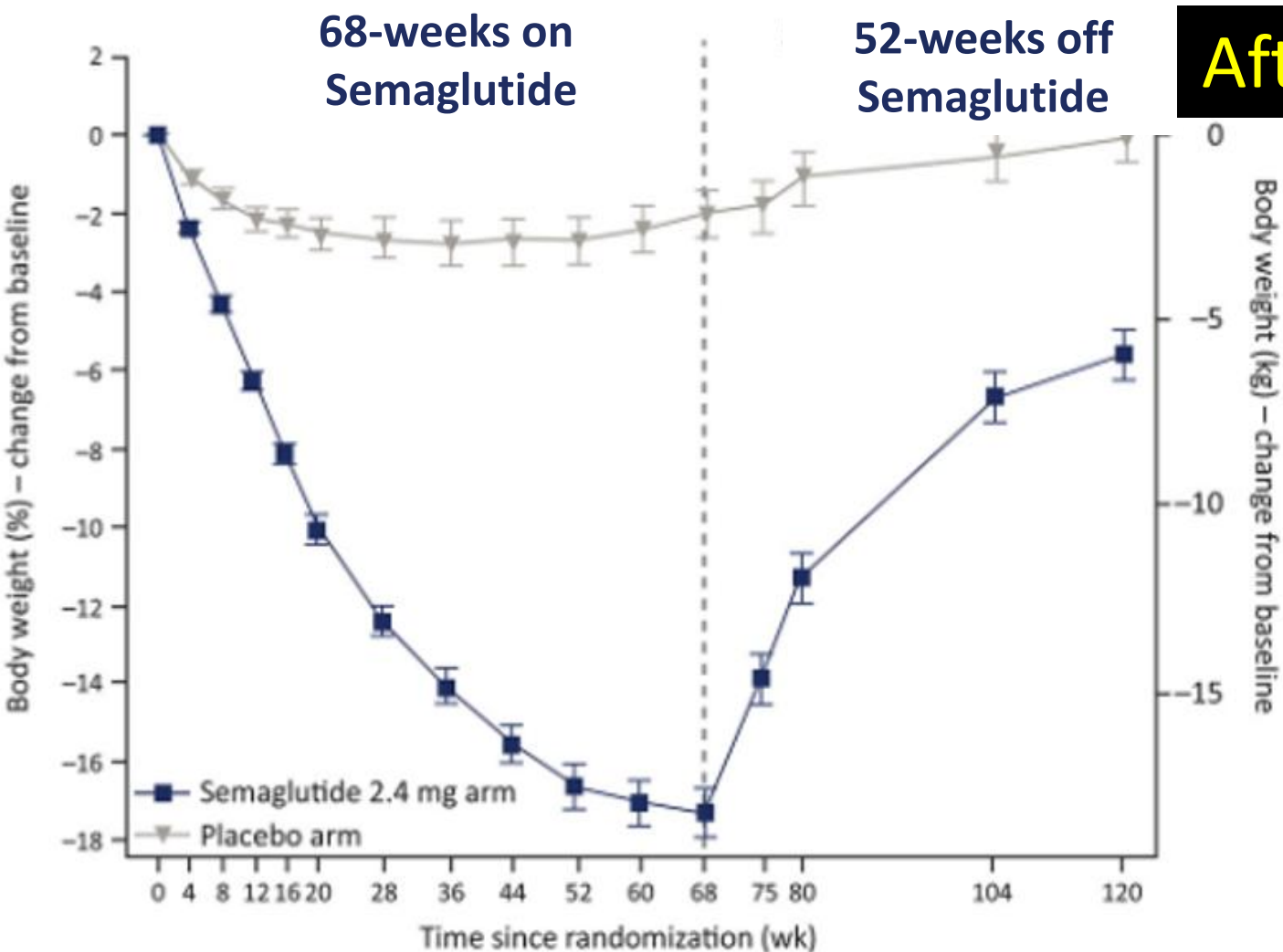
71 Year Old Female, Bilateral Knee OA, HTN, BMI 47.9
Presents requesting to lose the weight required to be
cleared for bilateral TKAs.



**Would you suggest
using an AOM?**

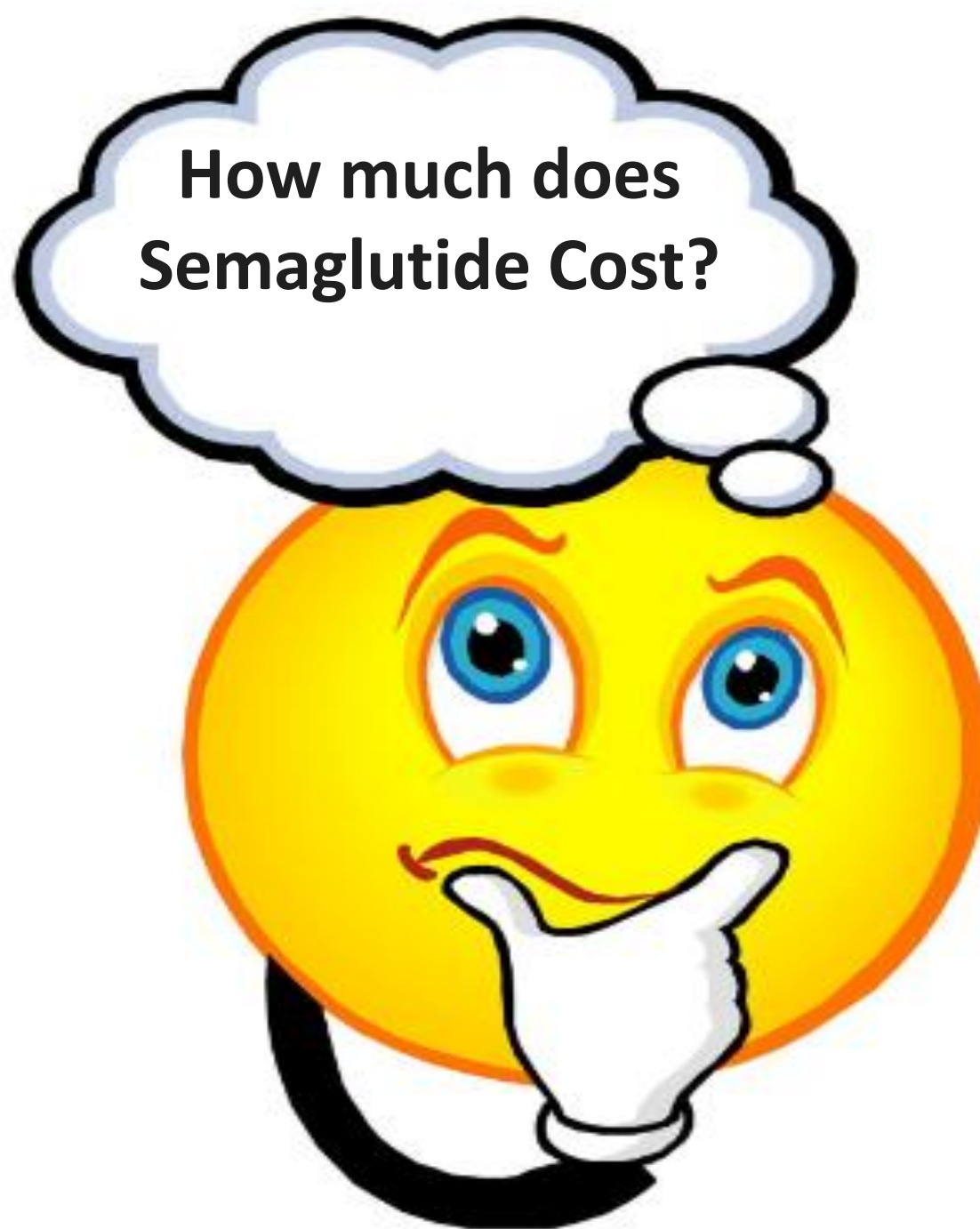


Semaglutide 2.4mg	Treatment (0 – 68)	Withdrawal (68 – 120)	% of weight regained	Net Loss (0 – 120)
Semaglutide	-17.3%	+11.6%	67.1%	-5.6%
Placebo	-2.0%	+1.9%	95%	-0.1%



After accounting for Weight Regain

**How much does
Semaglutide Cost?**



Cost of Anti-Obesity Medication (AOM) Use

Value = **Outcome** / **Cost**

GLP-1 Agonist

- **Semaglutide**

GoodRx



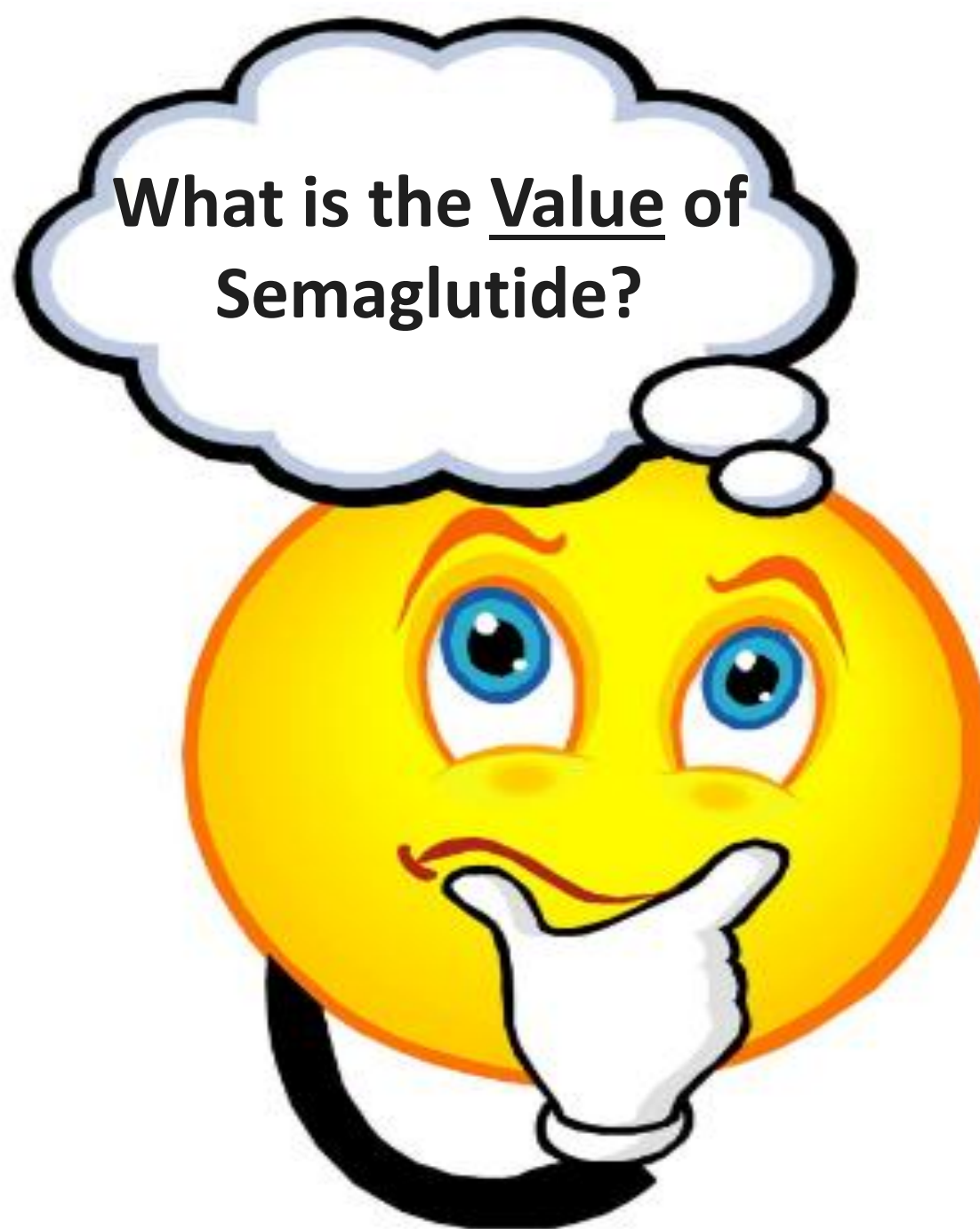
Rite Aid
1.7 miles

Coupon \$1,781

\$1,365



What is the Value of
Semaglutide?



Value of Anti-Obesity Medication (AOM) Use

$$\text{Value} = \text{Outcome} / \text{Cost}$$

Value of 68 weeks of Semaglutide
@ 68 weeks

$$\text{Value} = 17.3\% / \$23,205$$

$$\text{Value} = 1\% \text{ weight loss @ } \$1,341$$

Value of 68 weeks of Semaglutide
@ 120 weeks

$$\text{Value} = 5.6\% / \$23,205$$

$$\text{Value} = 1\% \text{ weight loss @ } \$4,143$$



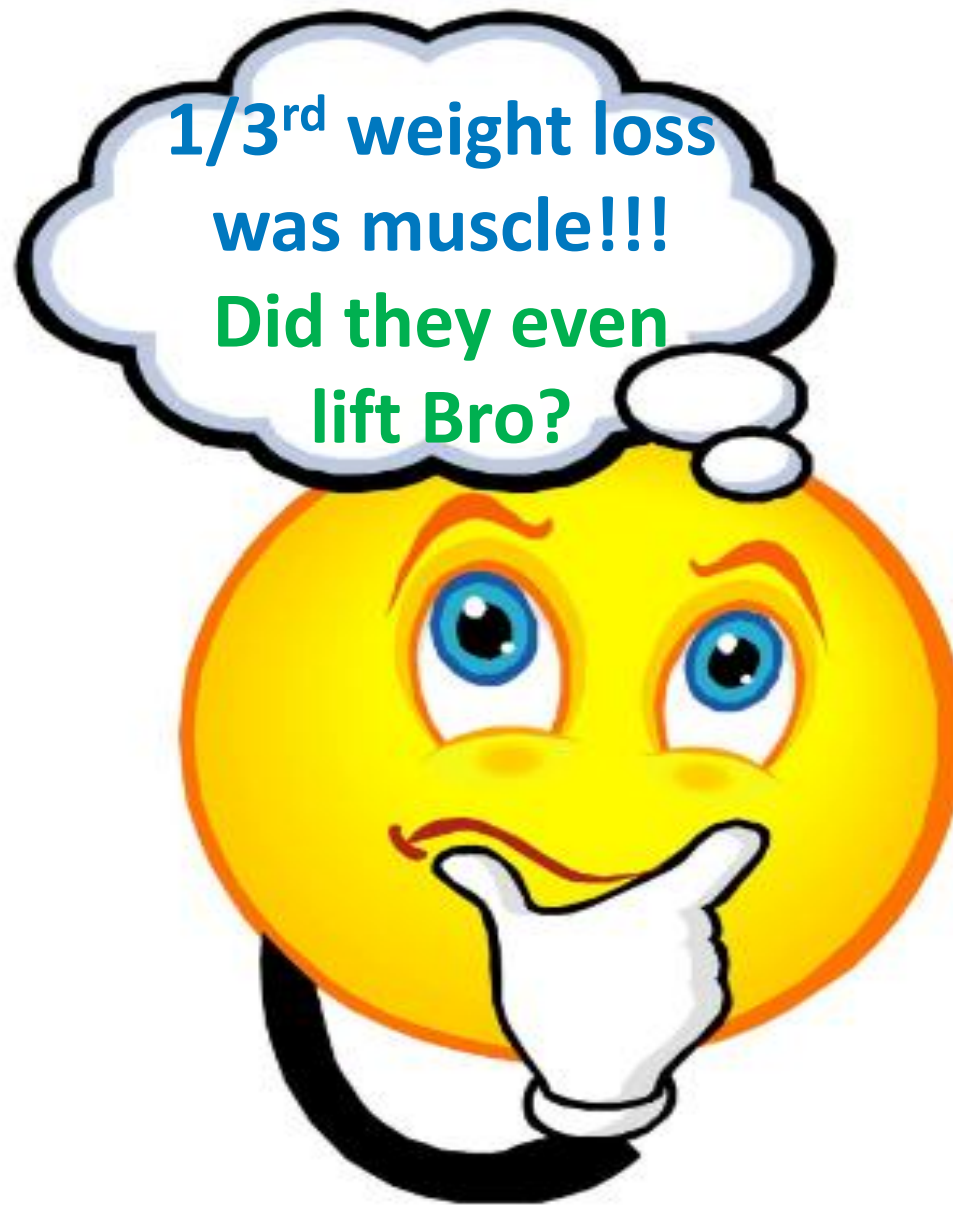
STEP 1 Supportive Secondary Endpoints Assessed in
the **DEXA Subpopulation** for the Treatment

	(n)	Baseline Weight	Baseline BMI	Weight Loss (%)	Fat Weight (%)	Lean Weight (%)
Semaglutide 2.4mg	95	216	34.8 ± 3.6	-30.0 (-13.9%)	-18.4 (-8.5%)	-11.6 (-5.4%)
Placebo	45	217	35.0 ± 3.6	-7.0 (-3.2%)	-3.0 (-1.4%)	-4.0 (-1.8%)

38.8% of the Weight Lost came from Lean Weight

**1/3rd weight loss
was muscle!!!**

**Did they even
lift Bro?**



Effect of Continued Weekly Subcutaneous Semaglutide vs Placebo on Weight Loss Maintenance in Adults With Overweight or Obesity

The STEP 4 Randomized Clinical Trial

Participants received lifestyle intervention from 0 – 68 wks

- Monthly counseling by qualified healthcare professionals
 - in person or by telephone.

Participants were prescribed

- Reduced-calorie diet (500-kcal/d deficit)
 - relative to estimated energy expenditure calculated at week 0
- **Increased physical activity (150 min/wk)**

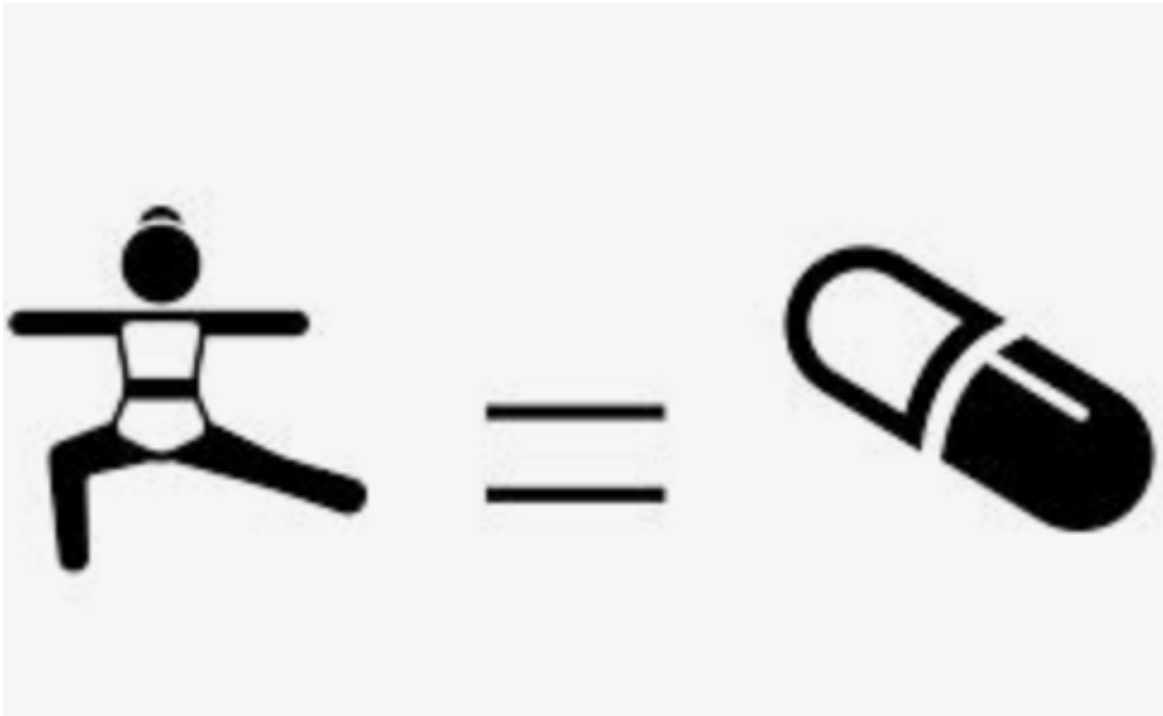
**What are the ACSM
guidelines for this
population?**



Special Populations: Obesity

- Adults with Obesity may benefit from progression to
 - 50 – 60 min on 5 days/week
(250 – 300 min/week)
- Some individuals may require progression to
 - 60 – 90 min of daily exercise
(420 – 630 min/week)
- **≥ 2 days per week of resistance training**

**If Exercise really is Medicine,
this was poor medical management**



Exercise Medicine in Medical Education

- On average, medical schools require **only 8 hrs of physical activity education** in their curriculum during the 4 years of schooling.⁵
- Likewise, the average primary care residency program offers **only 3 hrs of didactic training on physical activity, nutrition, and obesity**.⁶
- Even more concerning is that this deficiency extends into sports medicine fellowship training, in which a 2019 survey showed that **63% of fellows were never taught how to write an exercise prescription** in their training program.⁷
- This highlights the **need for the medical professionals to partner with exercise professionals** who possess a wealth of knowledge in exercise science to bridge the gap in healthcare and translate exercise science into exercise medicine.



Health

care

- This is no longer a **GAP** in knowledge
- This **GAP** exist in translating existing knowledge into innovative patient care?
- How do we best traverse this **GAP** in Healthcare?





Health

Research

care

- **For years, research has shown the benefits of exercise and physical activity**
 - However, we lacked the tools to release it's full potential
- **Most Healthcare professionals**
 - Have been able to give recommendations
 - But not personalized programs
 - Provide advice
 - But not monitor real-time adherence or outcomes
- **There has never been a seamless way to use exercise as a targeted treatment**

Until Now



Health

Research

Institutes

Care

Enterprise
Cancer
Institute

Enterprise
Heart, Vascular
& Thoracic
Institute

Enterprise
Medical
Specialty
Institute

Enterprise
Digestive
Disease
Institute

Enterprise
Primary Care
Institute

Enterprise
Surgical
Specialty
Institute

Enterprise
Hospital
Based Care
Institute

Enterprise
Neurosciences
Institute

Enterprise
Diagnostic
Services
Institute

Enterprise
Women's
Health
Institute

Enterprise
Children's
Services
Institute

Cancer

Cardiac
Rehab

COPD

Obesity

Aging

Fibromyalgia

Concussion

Stroke

Osteoporosis

HTN

Pulm
Rehab

Employee
Health

Wellness

MSK
Injury

Rheumatoid
Arthritis

Muscular
Dystrophy

Multiple
Sclerosis

Sarcopenia

Heart
Failure

CAD

DM
Diabetes

Asthma

Elevated
Cholesterol

Osteo
Arthritis

Physical
Therapy

Parkinson's

Chronic
Pain

Alzheimer's

Exercise as Medicine has universal application for various health issues across multiple institutes.

Health

Research

Education

Institutes

care

Exercise Physiology Masters

**John Carroll
University**



**Kent State
University**



**Cleveland State
University**



Health

Research

Education

Community

Institutes

care

Cleveland Clinic doctor transforms community gym into free, high-tech workout space in Fairfax neighborhood



NEWS 5
CLEVELAND

It comes at a critical time as the National Institute of Health reports people in marginalized communities have a higher risk of diabetes, heart issues, and cancer

It Takes Both Sides to Build a Bridge

BRIDGE PROJECT

Bridging Research and Institutes through Digitally Guided Exercise Prescriptions & Reliable Outcomes by Joining Education & Community with Technology

Exercise
Professionals

Healthcare
Professionals

Technology

Health

Research

Education

Community

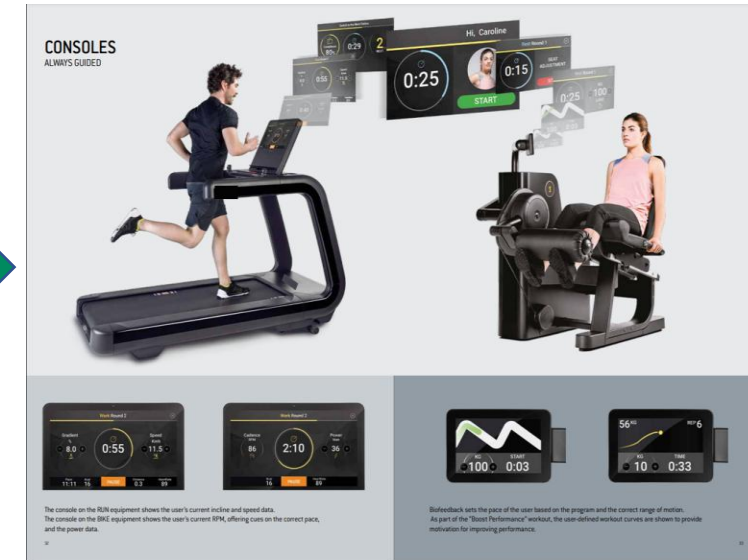
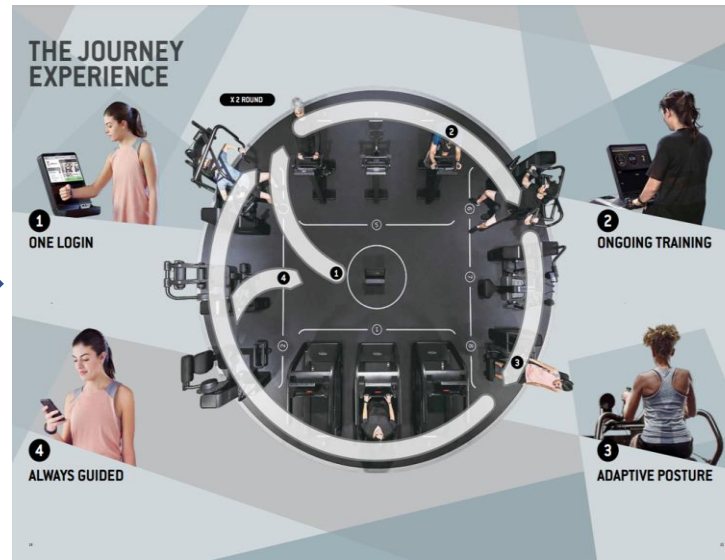
Institutes

Care

Transforming Patients into Independent Exercisers

Transforming
Clinical Encounters

Enhanced by Visual
Feedback



Digitally Guided
Exercise Prescription

Exercise Physiologists Performs Assessment

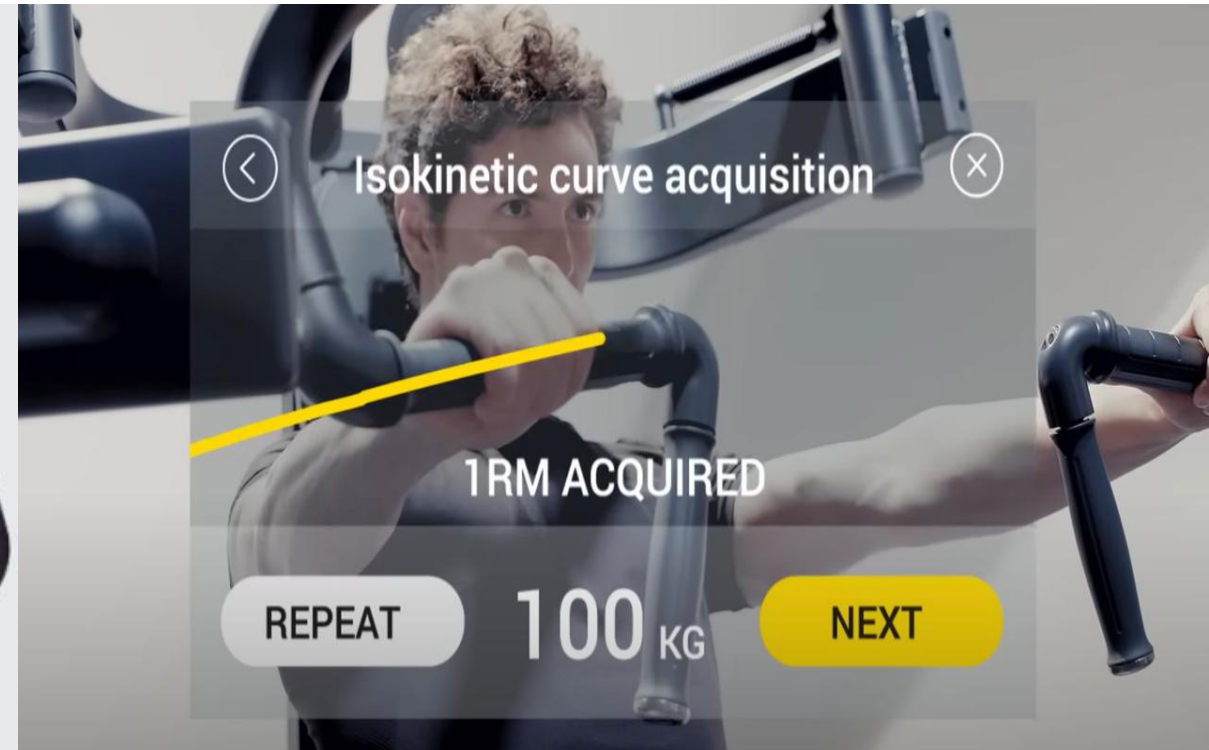
Body
Composition



Cardiorespiratory Fitness
(VO_2)



Strength Testing
(1 Rep Max)



THE JOURNEY EXPERIENCE

1

ONE LOGIN

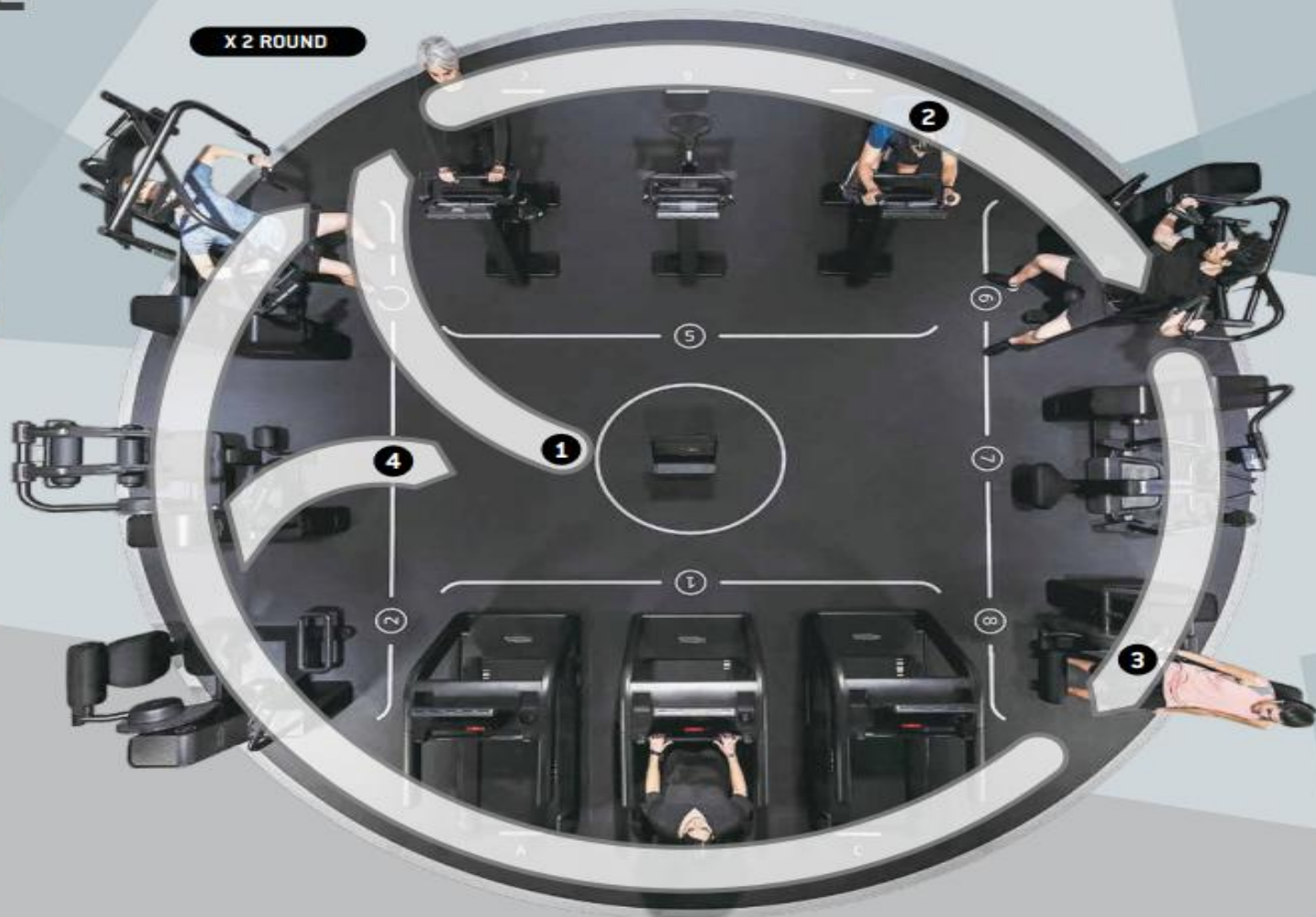
Users log into the UNITY® SELF to start the workout. They are shown their BIOCIRCUIT™ PLAN and directed to their first station or placed on the waiting list. Each user can start from any station available.



4

ALWAYS GUIDED

At the end of 2 laps, the circuit ends. Users can then go and check their results on the UNITY® SELF or on the MYWELLNESS® APP.



2

ONGOING TRAINING

Upon arrival at each station, users simply start exercising with no login, the machines will be already preset. 3'15" work on RUN and BIKE, users can change speed, incline or power.



3

ADAPTIVE POSTURE

At the end of each exercise, users are redirected to the following station with 30" rest time to transition. 45" work on BIODSTRENGTH™, users can adjust the workload.



Biofeedback



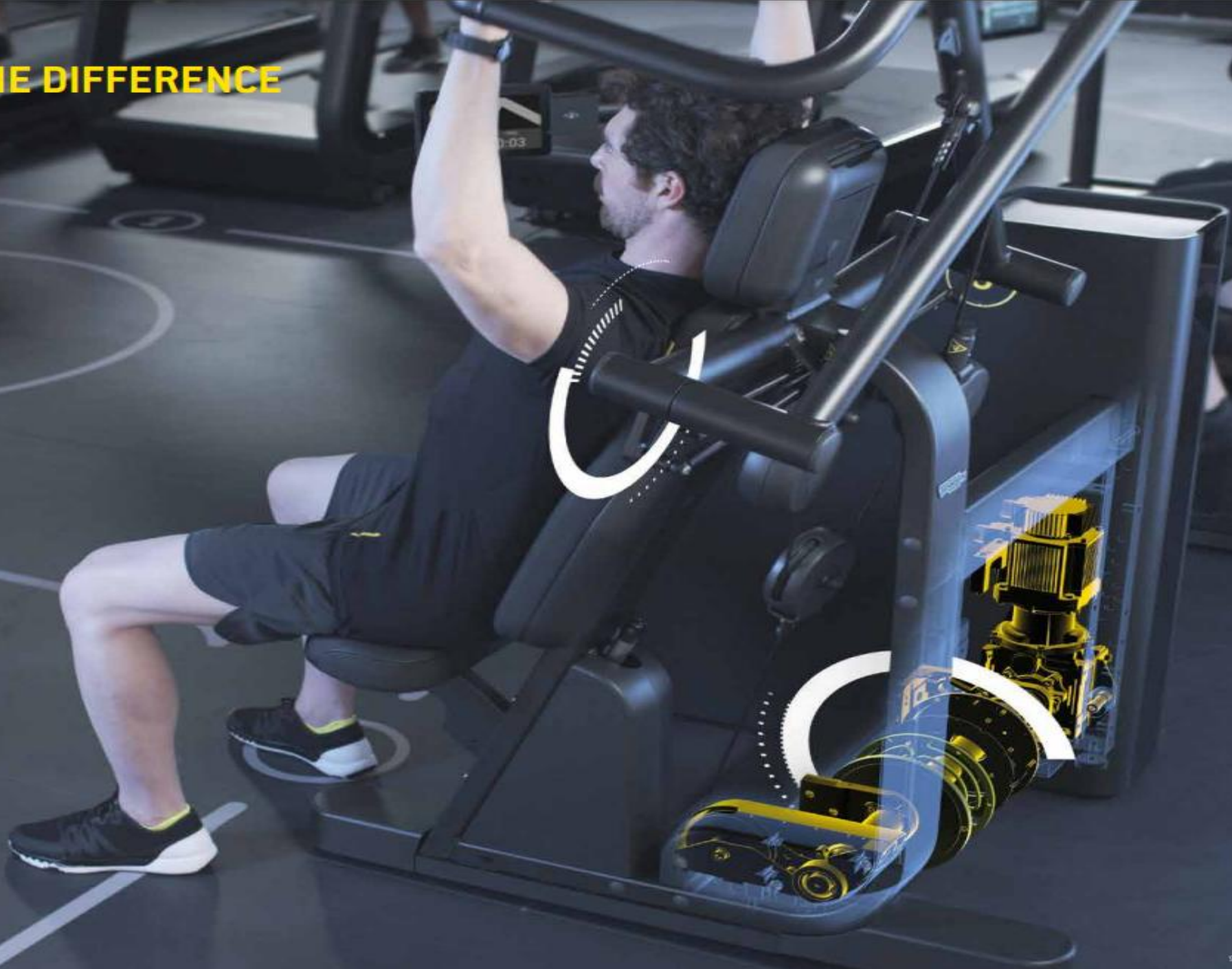
BIODRIVE™ KNOWS THE DIFFERENCE

BIODRIVE™ is an exclusive **patented technology** that can only be found in the **BIOSTRENGTH™ LINE** of equipment.

BIOCIRCUIT™ is the first training system to offer a personalized workout in a safe, easy and effective way. The key is **BIODRIVE™**, a sophisticated intelligent drive that assures the best biomechanics and feeling ever.

Based on revolutionary aerospace technology, **BIODRIVE™** is a motor controller that delivers a tailored workout to help you achieve the best results in a short amount of time.

BIODRIVE™ is also connected to the first training program synchronized with the native software of the circuit. It requires only one login and is totally customizable to the users' needs.



Isotonic vs Isokinetic Strength Testing

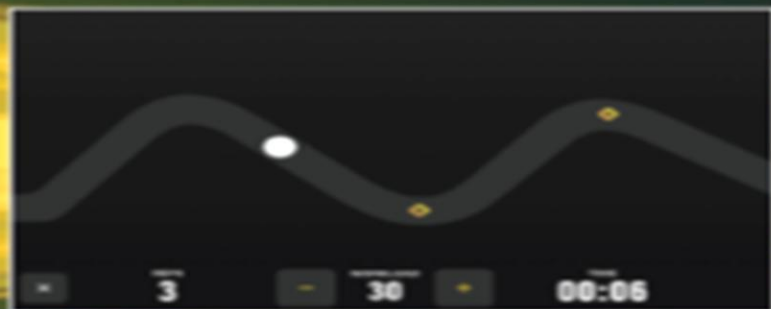
Isotonic Strength Testing

- Involves movements that mimic real-life activities, which may enhance functional relevance but may pose a higher risk of overload injuries or musculoskeletal if performed with poor technique ^{17,18}

Isokinetic Strength Testing

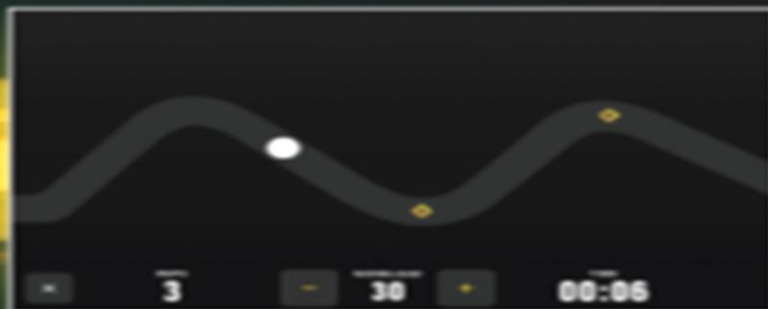
- Accommodate pain, fatigue, changes in length–tension curve, and biomechanical leverage of the muscle allowing for safe efficient exercise testing ¹⁹
- Isokinetic dynamometers accommodate the individual's strength throughout the range of motion, minimizing the risk of muscle overload or excessive stress on the joints compared to isotonic exercises with free weights ²⁰
- This becomes a valuable option when working with patients new to resistance training





ISOTONIC

Increase muscle mass gradually with constant tension through the full range of movement.



NO INERTIA

Protect joints by reducing load at the start of movements and lowering speed at the end.



ECCENTRIC OVERLOAD

Speed up muscle development by incrementally adding load (10-50%) during the eccentric phase of movements.



ECCENTRIC REDUCTION

Prevent muscle soreness by incrementally reducing load (10-50%) during the eccentric phase of movements.



VISCOUS

Maximize muscle engagement with resistance that gets more challenging the harder a user pushes.



ELASTIC

Improve speed with resistance that progressively adjusts through the full range of motion.



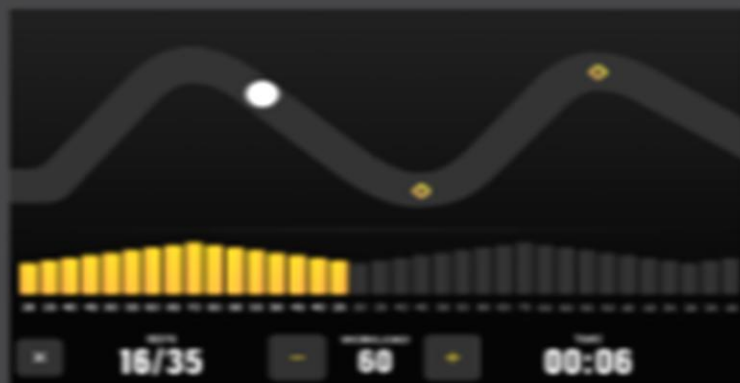
PYRAMID

The amount of reps and load automatically varies with each set to boost strength and muscle mass.



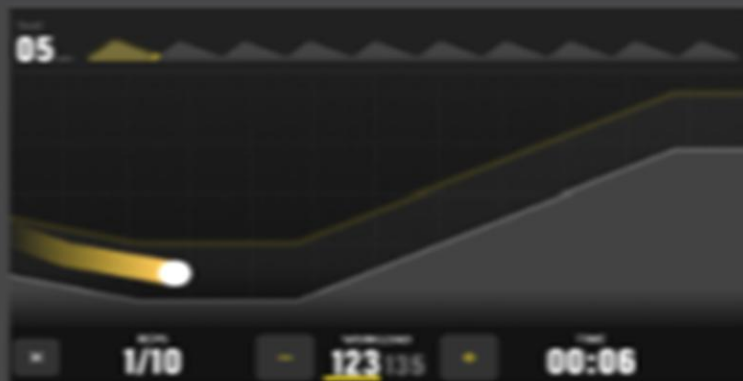
DROP SET

After reaching the maximum reps, the load decreases allowing users to push muscles to exhaustion.



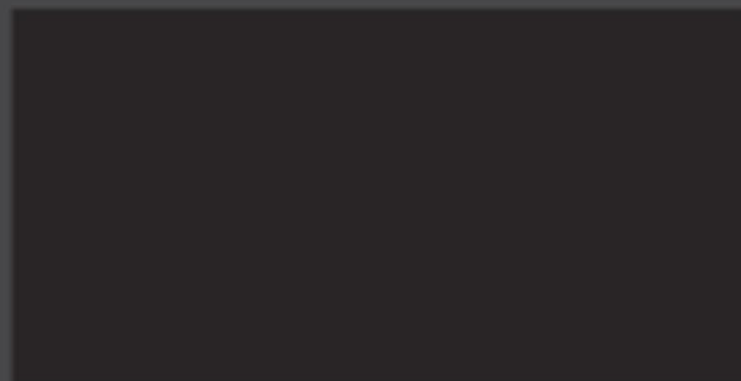
TONE EXPRESS

In a single set, users experience varying loads with each rep to increase muscle tone and mass, while saving time.



SUPER-SLOW

Slowing the movement increases the time under tension of muscles for more effective training.



CONTRAST

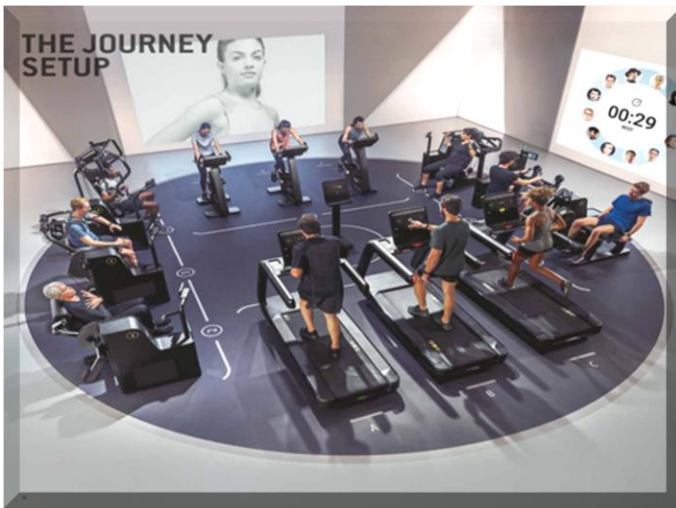
Alternating heavy weights with high-speed movements improves both strength and power.



REST-PAUSE

Max rep sets are followed by short recovery periods for high-intensity workouts that increase muscle mass.

Integration into Electronic Medical Records and Data Registry

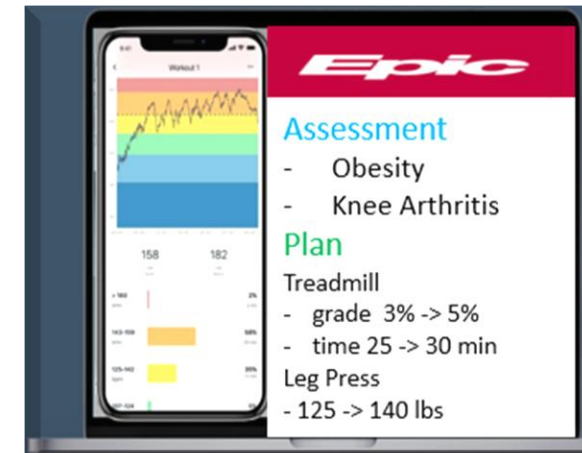





Uploaded to
Cloud

Exported to
BRIDGE-PROJECT
Data Registry



Automatically
Integrated with EMR



TechnoGymTestC
ZZZ

Female, 34 year old,
8/7/1990

MRN: 95030165
eMRN: E14044364802
Code: Full Code by Default
ACP/Adv Dir:

COVID-19: No Recent Tests
Isolation: None

No PCP
Coverage: None

Allergies: Not on File

PDMP/Narx Score: **None**

PT REMINDERS
None +

11/13 OFFICE VISIT
No vital signs recorded for
this encounter.

Future Appts: None




LAST 3YR
No visits

HEALTH MAINTENANCE
None

ENDOCRINOLOGY
PROBLEMS (0)
Other problems (0)

Current Medications

SOCIAL DETERMINANTS

←→

SnapShot

Chart Re...

Results

Review F...

Intake

Histo

Episode Flowsheet

Dates in: Columns Rows

Newest data on the: Left Right

Group data

Legend

Refresh

Filtered to selected episode: MyWellness Patient Entered Flowsheet

	11/14/2024
Weight (lbs)	202.83 lbs 154.8 lbs
Body Mass Index	31.8 25.17
Body Fat Mass (BFM) (%)	39 %
Body Fat Mass (BFM) (lbs)	79.17 lbs
Fat Free Mass (BFM) (lbs)	123.66 lbs
Total Body Water (lbs)	92.81 lbs
Moves	262 275
Calories Burned (kcal)	110 kcal 116 kcal
Treadmill Distance (miles)	0.04 miles
Weight Lifted (lbs)	4351.92 lbs 9515.14 lbs
Lower Back Biostrength 1RM (Isokinetic) (lbs)	96.78 lbs
Extension Biostrength 1RM (Isokinetic) (lbs)	145.28 lbs
Total Abdominal Biostrength 1RM (Isokinetic) (lbs)	61.29 lbs
Leg Curl Biostrength 1RM (Isokinetic) (lbs)	84.88 lbs
Leg Press Biostrength 1RM (Isokinetic) (lbs)	516.1 lbs
Low Row Biostrength 1RM (Isokinetic) (lbs)	223.33 lbs
Vertical Traction Biostrength 1RM (Isokinetic) (lbs)	147.93 lbs
Shoulder Press Biostrength 1RM (Isokinetic) (lbs)	179.02 lbs
Chest Press Biostrength 1RM (Isokinetic) (lbs)	275.8 lbs
Arm Extension Biostrength 1RM (Isokinetic) (lbs)	67.02 lbs
Arm Curl Biostrength 1RM (Isokinetic) (lbs)	52.69 lbs