

Fitness for PCOS:

Strategies for Insulin Resistance and Fat Loss



PCOS Symposium

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Agenda

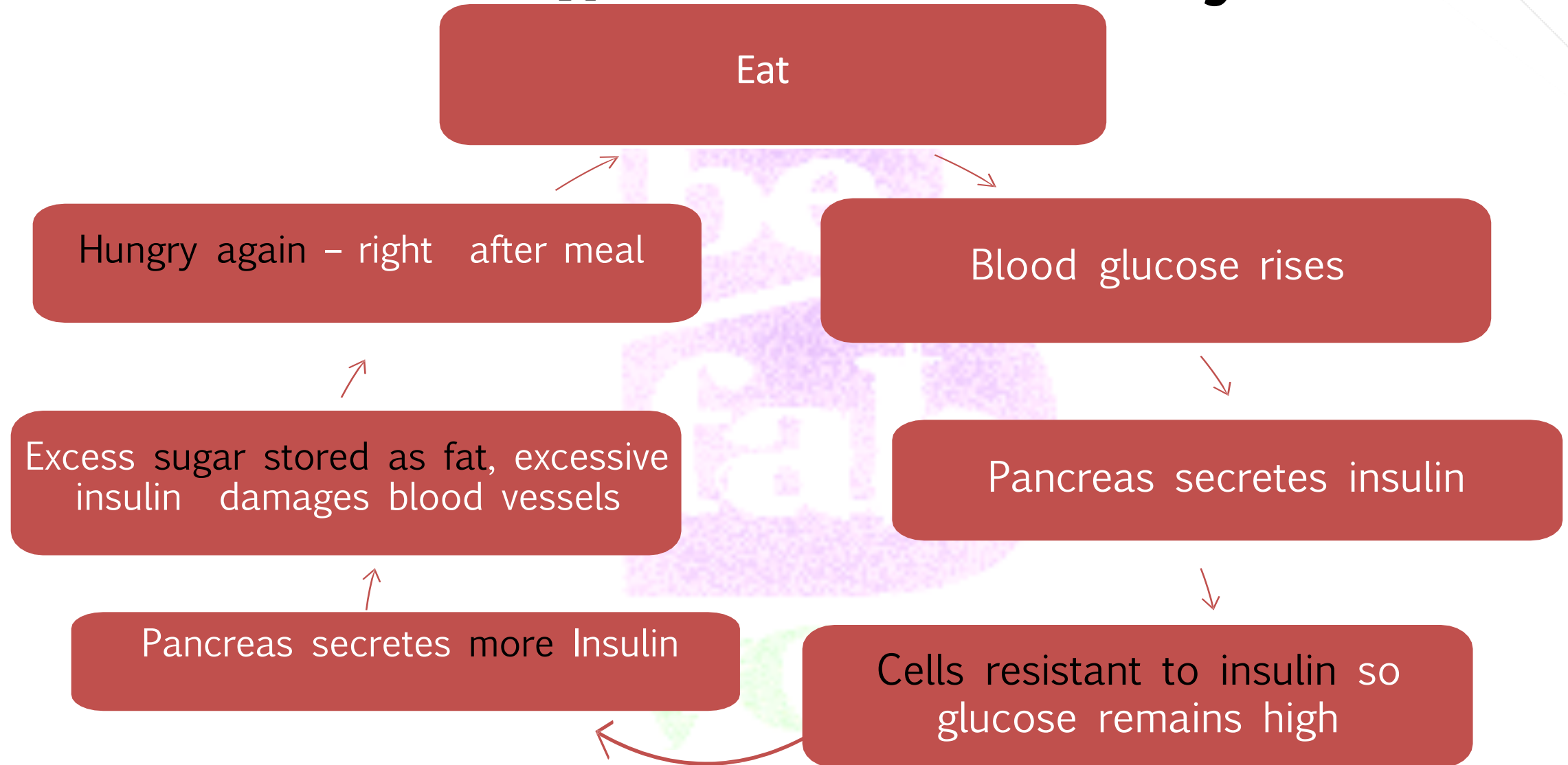
- **How Does Exercise Increase Insulin Sensitivity?**
 - Effective physical activity styles
 - Seconds of awesomeness
- **Are You Friends With Growth Hormone and Leptin?**
 - Optimizing GM to build muscle and burn fat
 - Fat cells and your brain
- **How Does Exercise Fuel Your Energy?**
 - Insulin, cell metabolism, and energy production

Note: Citing for scientific literature is listed at the end of this presentation.

MEDICAL DISCLAIMER:

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Blood Sugar Imbalance Cycle



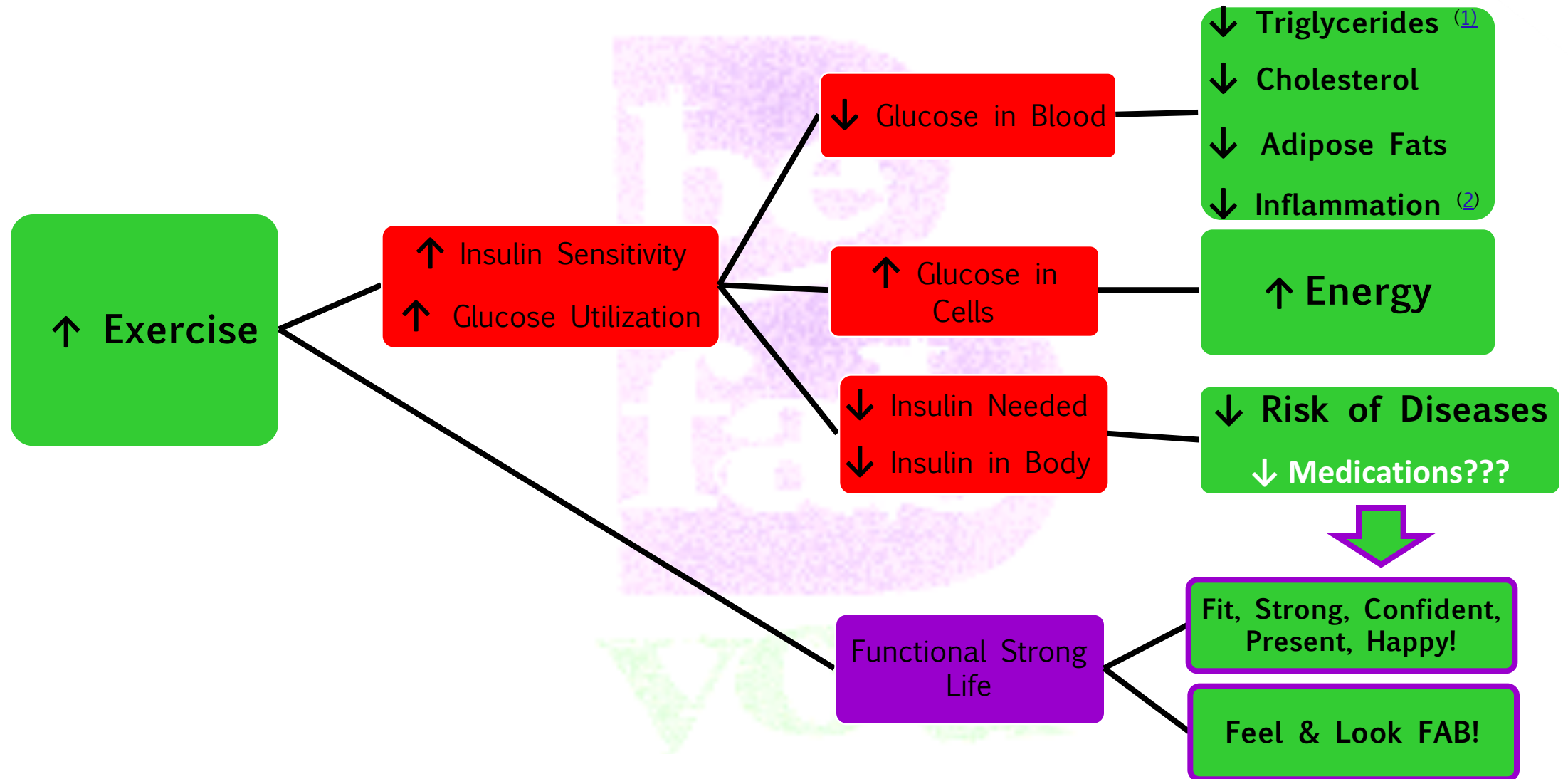
Lifestyle Areas For Balance Restoration



Fitness: Be Moving!



The Best Prescription Yet is *FREE!*



What Is The Best Exercise Routine?

The one that get us moving and energetic!



- Trained muscle **uses glucose more efficiently** ⁽³⁾
- ↑ Lean muscle = **accelerate fat burning** ⁽⁴⁾
- Quality vs. quantity ⁽⁵⁾
- 10 minutes a day – the new marathon! ⁽⁶⁾
- Movements to optimize growth hormone ⁽⁷⁾



30-Second Exercises

Burn Fat for Hours



Exercise Intensity & Duration



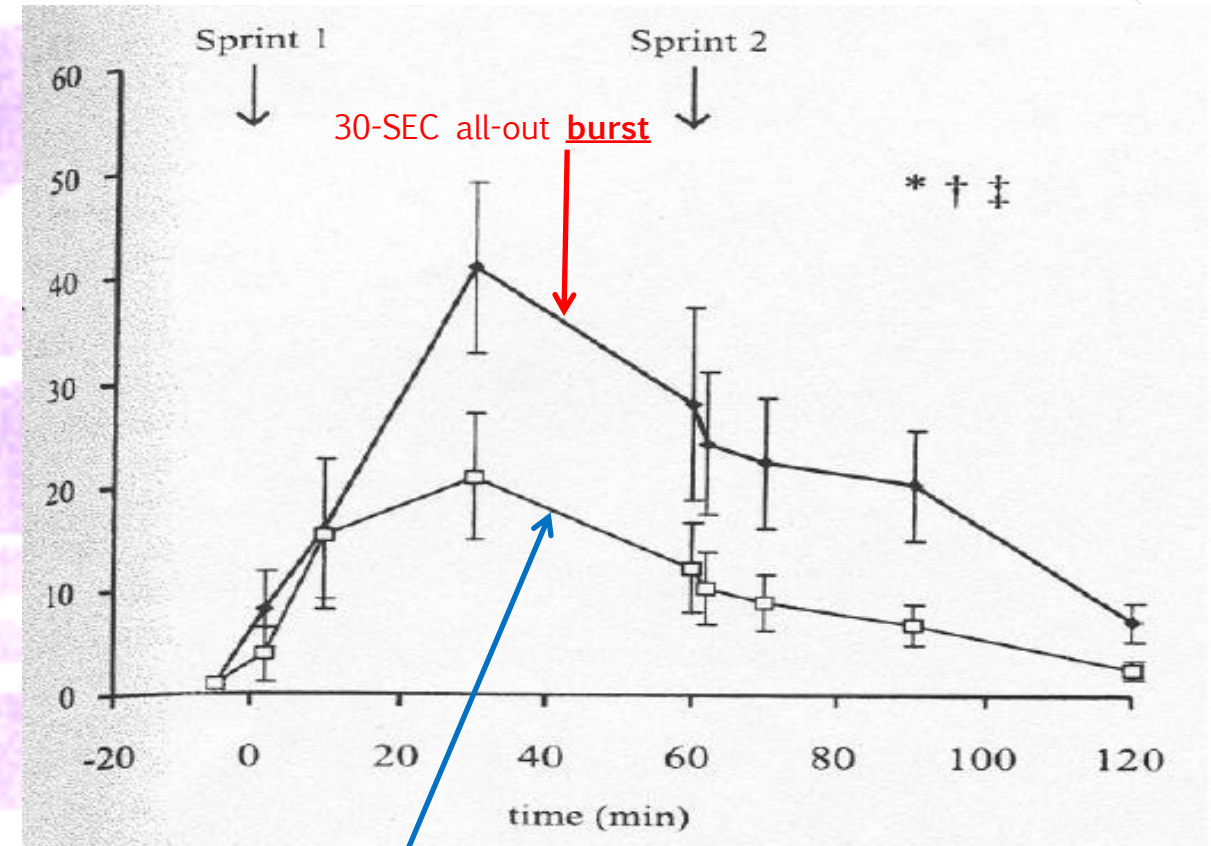
➤ **30 seconds burst (all-out) elevates growth hormone more than **30 minutes of moderate intensity aerobics**. Plus stays up for 90 minutes.**

➤ Repeated exercise bouts during the day, well-apart in time, produce significantly greater total GH secretion.⁽⁸⁾



Effects of Exercise on Growth Hormone

- Notice the amount of GH secreted is higher with 30-second sprint
- A second sprint at 60 minutes does nothing to GH
- The optimal timing of sprints (bursts) appears to be 120 minutes



30-MIN aerobics

Growth Hormone Response to Intense Exercise

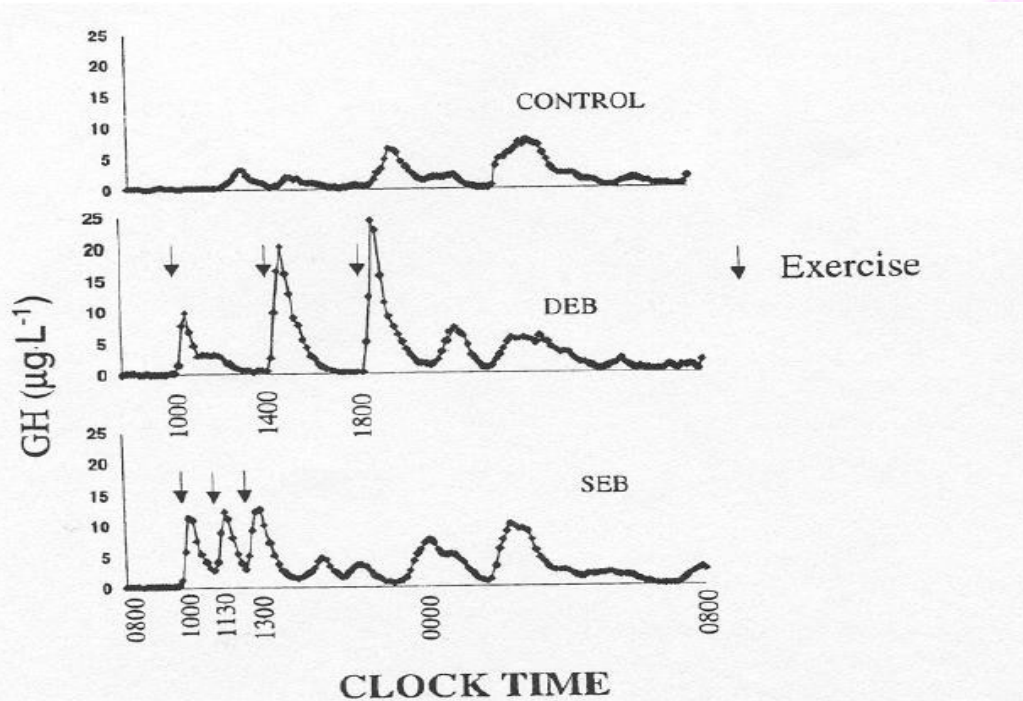


Fig. 2. Mean serum growth hormone (GH) concentrations during blood sampling at 10-min intervals over 24 h on C, SEB, and DEB days.

- **SEB = sequential exercise bouts:** new exercise bout was begun at the 90-minute mark after the previous one
- **DEB = delayed exercise bout:** new exercise periods were spaced at 4-hour intervals
- **GH = growth hormone:** intensity increased with each successive bout when spaced 4 hours apart
- **NOTE:** GH response to exercise is blunted in obesity

Tabata: Aerobic and Anaerobic

The **TABATA**
Method

4 Minute Workout

8 Rounds

20 Second Maximum Effort

10 Second Complete Rest

=

Fat Blasting, Body Sculpting Workout!

- Moderate level for a continuous period
- vs.*
- Intermittent high intensity (IE) bursts
- =*
- IE may tax both the **anaerobic & aerobic** energy releasing systems almost maximally
- =*
- Effective way to improve aerobic & anaerobic fitness
(9, 10)

Walking and Aerobic Exercise: Effects on Insulin Resistance

- Reduces visceral fat and improves insulin resistance ⁽¹¹⁾
- **Decreases cardiac risk** through mechanisms other than insulin regulation
- 30-40 minutes of moderate walking reduces heart disease risk by 40% and cancer risk by about 35%, almost as much as more intense aerobic exercise
- **The benefits of walking are equal or better when it is broken up into multiple 10-minute sessions** than if engaged in all at once ⁽¹²⁾



Fitness Guidelines Action Plan

Jumpstart Blood Sugar Control & Insulin Resistance



✓ Prep for day

- 30-sec bursts shortly after waking

✓ Prep for daily performance

- **30-60 min of movement** (short segment is OK) **4+ times/**
 - Make it count! Add strength/resistance training 2-3x
- Burst throughout day
 - **Beginner:** 30-second bursts 3-4 times a day. Goal: extend duration to 2x 60sec
 - **Intermediate:** 30-second bursts 4-6 times a day or incorporate into your regular aerobics routine; 30-sec bursts interspersed with 2-3 minutes of low intensity aerobic intervals
 - **All levels:** 4 minute Tabata. Start with 1x week!

✓ Prep for fat burning

- Short burst **2 hours after dinner** (or **1 hour before**

Growth-Hormone Maximizing Exercise Regime

- 2-3 minute burst-type **exercise in AM** on rising
- No-carb or **lo-carb breakfast**
- 30-60 minutes of **walking during day** (10-15 minute segments is OK)
- **Add sprints** to normal jogging, swimming, cycling routines
- **4-6 exercise bursts and Tabatas** throughout the day
- 2-minute **burst 2 hours after dinner** (lowers blood glucose by 20-40 points)
- **No food after exercise or before bed** (food 3 hours, exercise 1 hour)



The Fitness Factor Action Plan

Have FUN with new exercises:

- ✓ Daily push-up challenge
- ✓ Squats
- ✓ Side stepping
- ✓ Band stretches
- ✓ Deadlifts with dumbbells



Add stretching to your fitness routine:

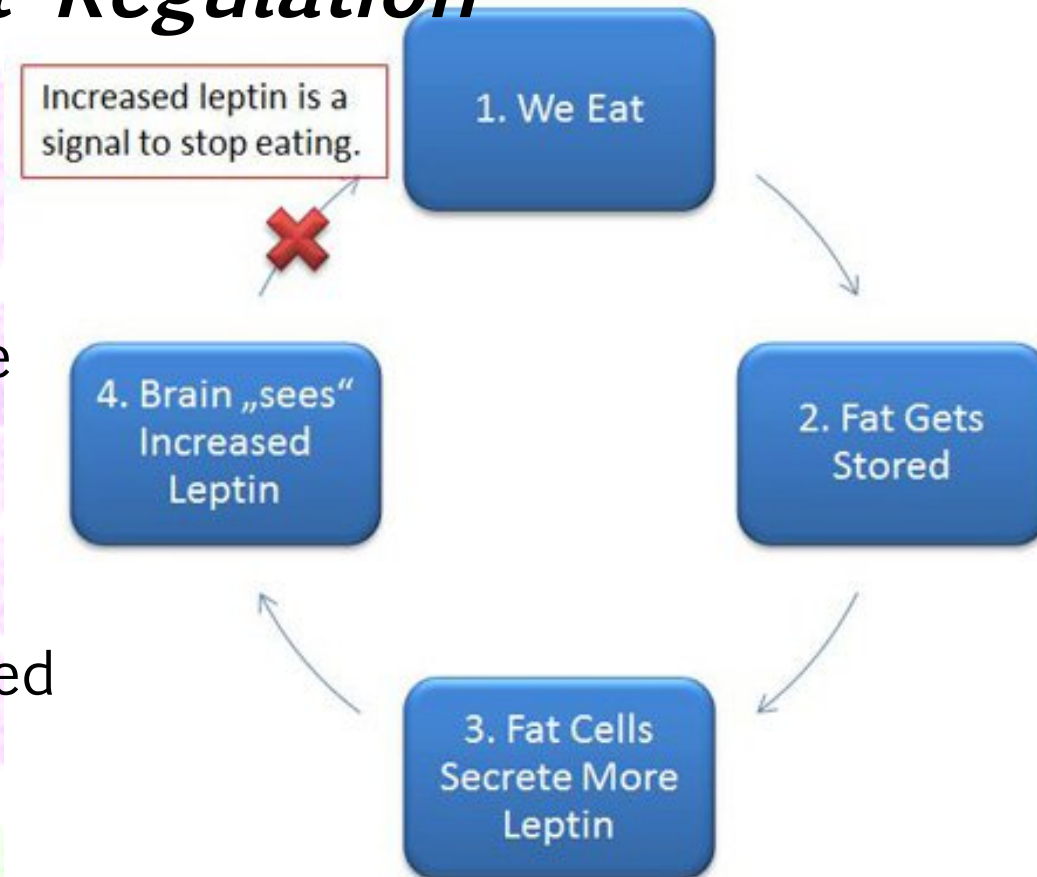
- ✓ Yoga, Pilates, [Classic Stretch](#), build your own combo



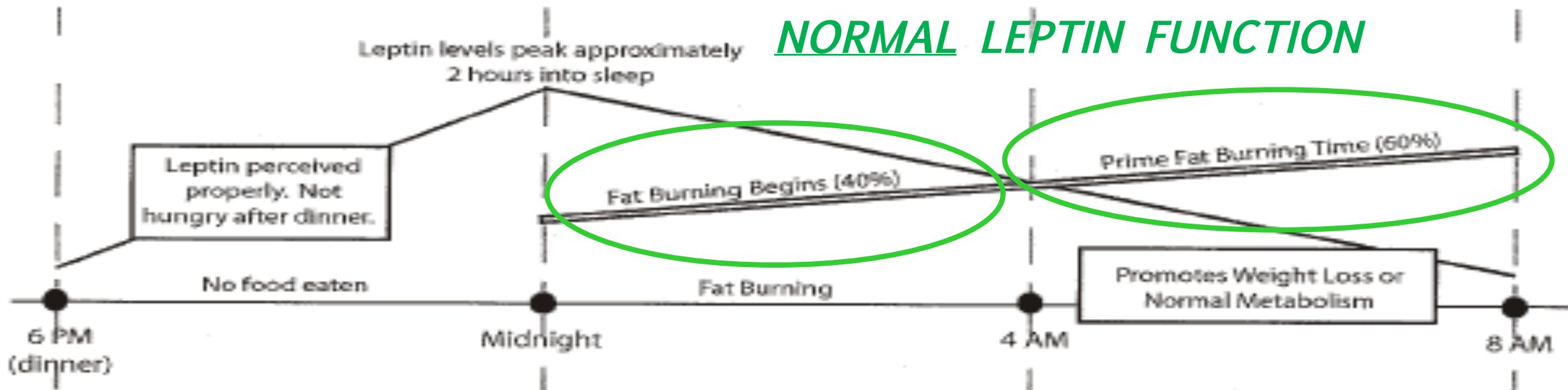
Leptin

Master Hormone of Fat Regulation

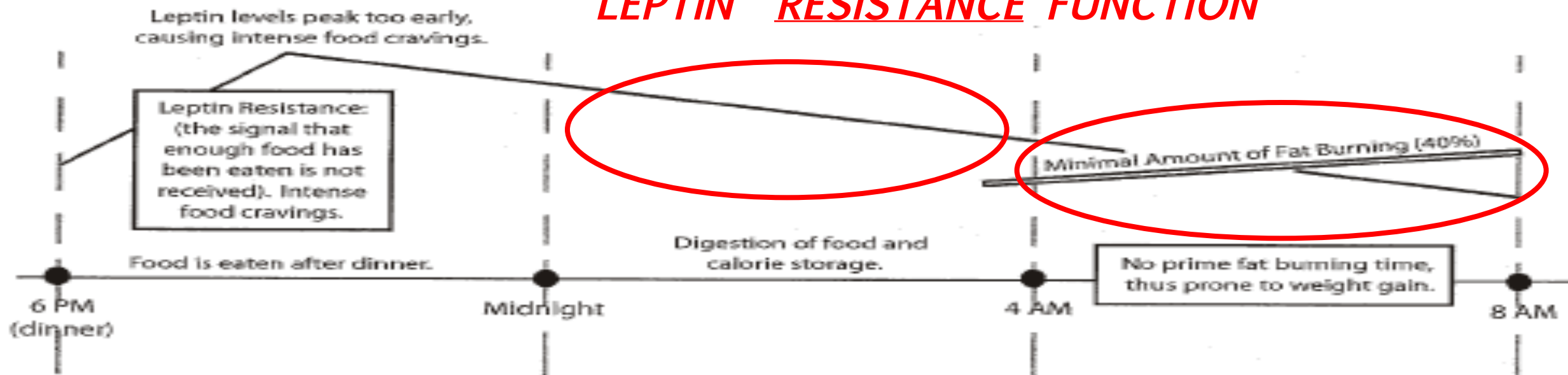
- ✓ Secreted by the fat cells – the white adipose tissue
- ✓ Signals the hypothalamus and pancreas “we are full”
- ✓ Hypothalamus turns off appetite. Pancreas stops producing insulin
- ✓ Has a 24-hour circadian rhythm and is controlled by eating
- ✓ ***Pancreas and hypothalamus become leptin resistant*** [\(13\)](#)



NORMAL LEPTIN FUNCTION



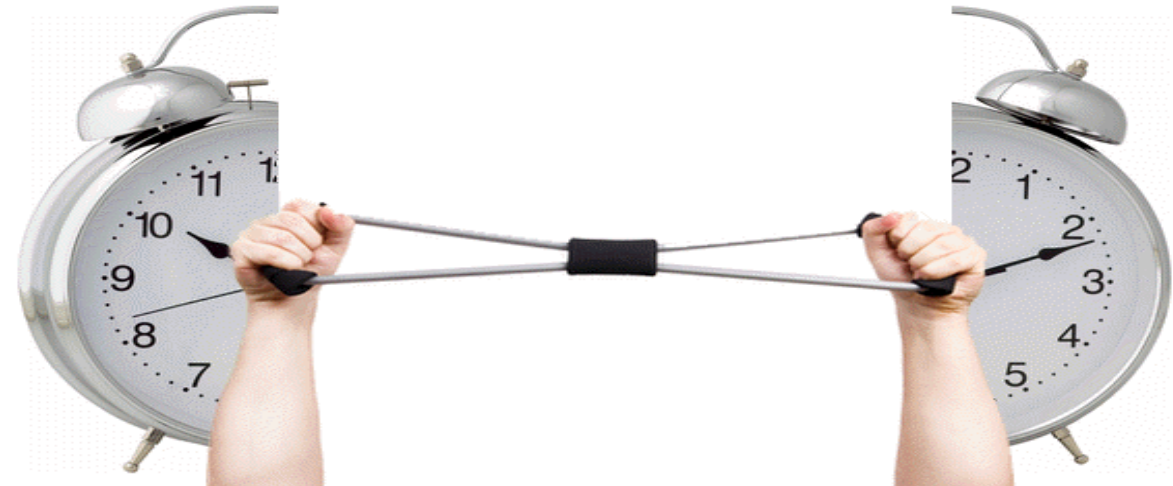
LEPTIN RESISTANCE FUNCTION



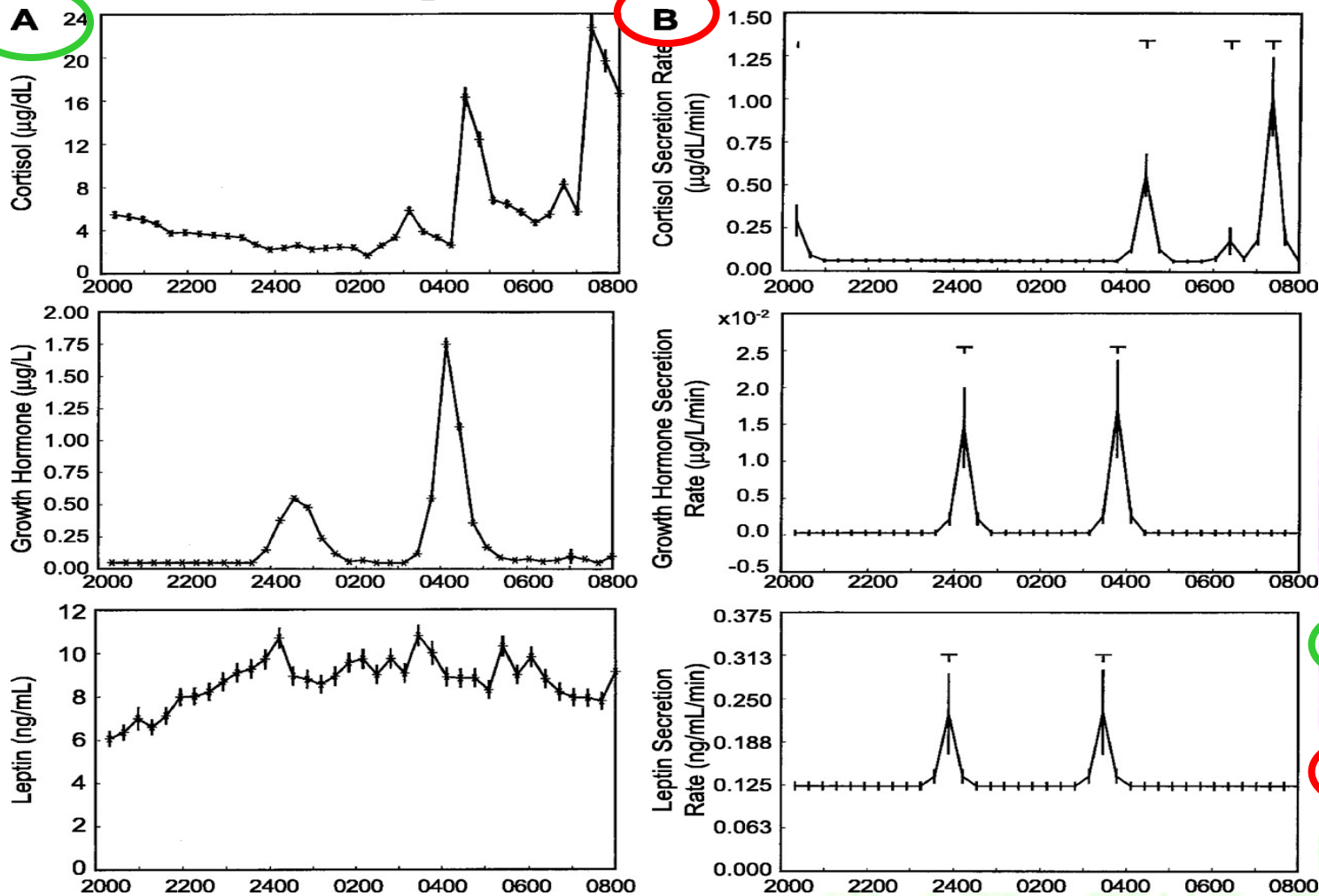
Rules for Managing Leptin and Insulin

PRIORITY: INCREASE INSULIN SENSITIVITY

- ✓ **Do Not** eat or snack after dinner. Water or herbal tea is OK!
- ✓ Eat slowly
- ✓ Eat a breakfast containing protein
- ✓ Eat only three meals a day
 - ✓ Allow 5-6 hours between meals
 - ✓ Avoid high-carbohydrate breakfasts
 - ✓ Avoid snacking between meals
- ✓ Avoid large meals
- ✓ Reduce the intake of starchy carbohydrates



Leptin, Insulin, GM, Cortisol



Take away:

✓ Management of these 'survival' hormones through **exercise and lifestyle** lowers the risk of metabolic and chronic diseases!

✓ Ask yourself:

- ✓ What activities do I have control and can improve execution?
- ✓ What do I need to succeed?

A: Detail of cortisol, growth hormone (GH), and leptin secretion data by clock time (h) for an individual patient.

B: Detected pulses for cortisol, GH, and leptin by clock time for same subject. Note that lag time bet and

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Endocrinology and Metabolism

[Polyxeni Koutkia et al. Am J Physiol Endocrinol Metab 2003;285:E372-E379](#)

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Getting Glucose/Sugar Into Cells

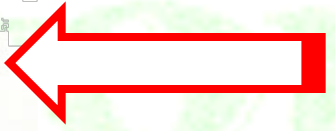
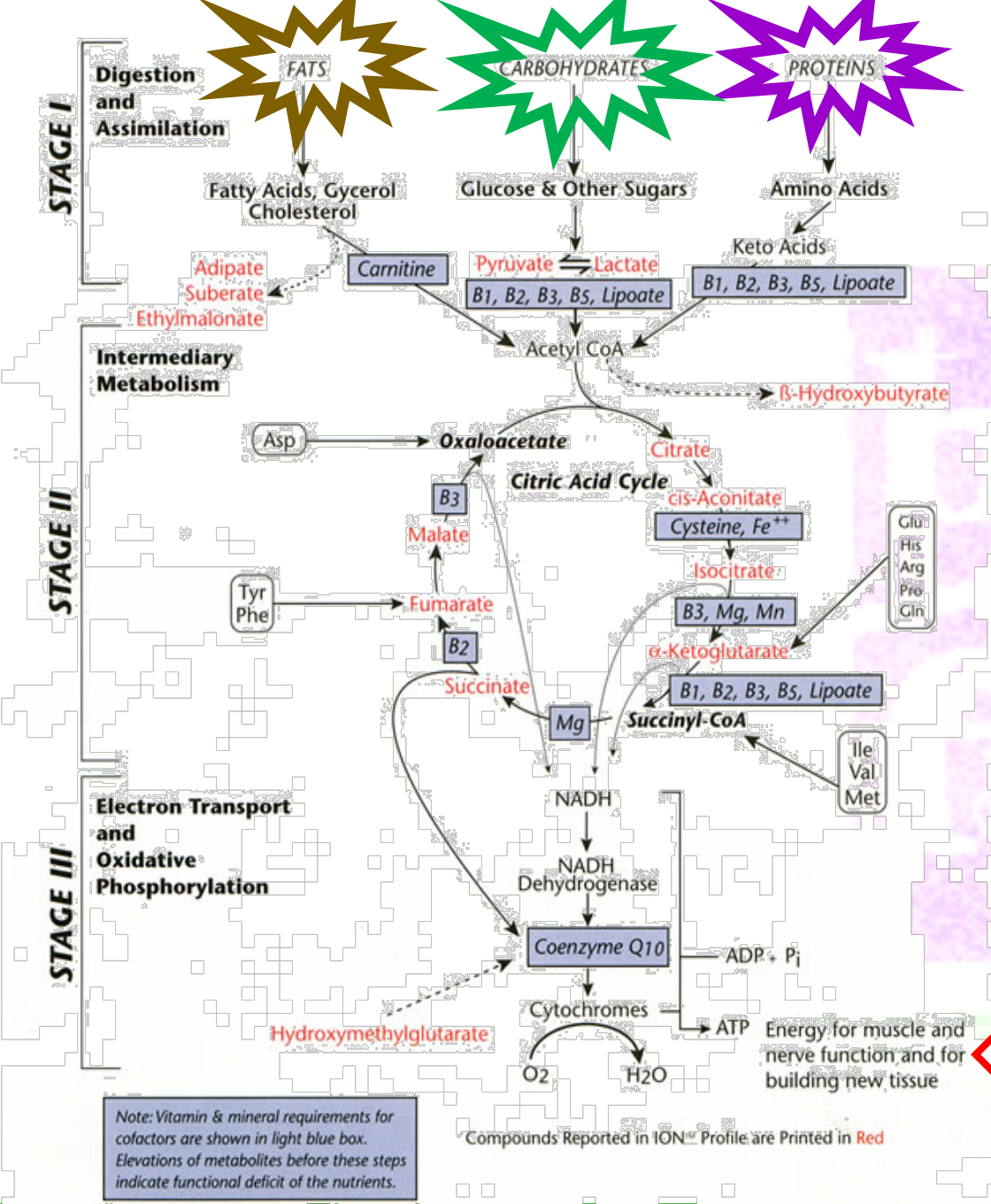
- ✓ Insulin
- ✓ Healthy Insulin Receptors
- ✓ Nutrients



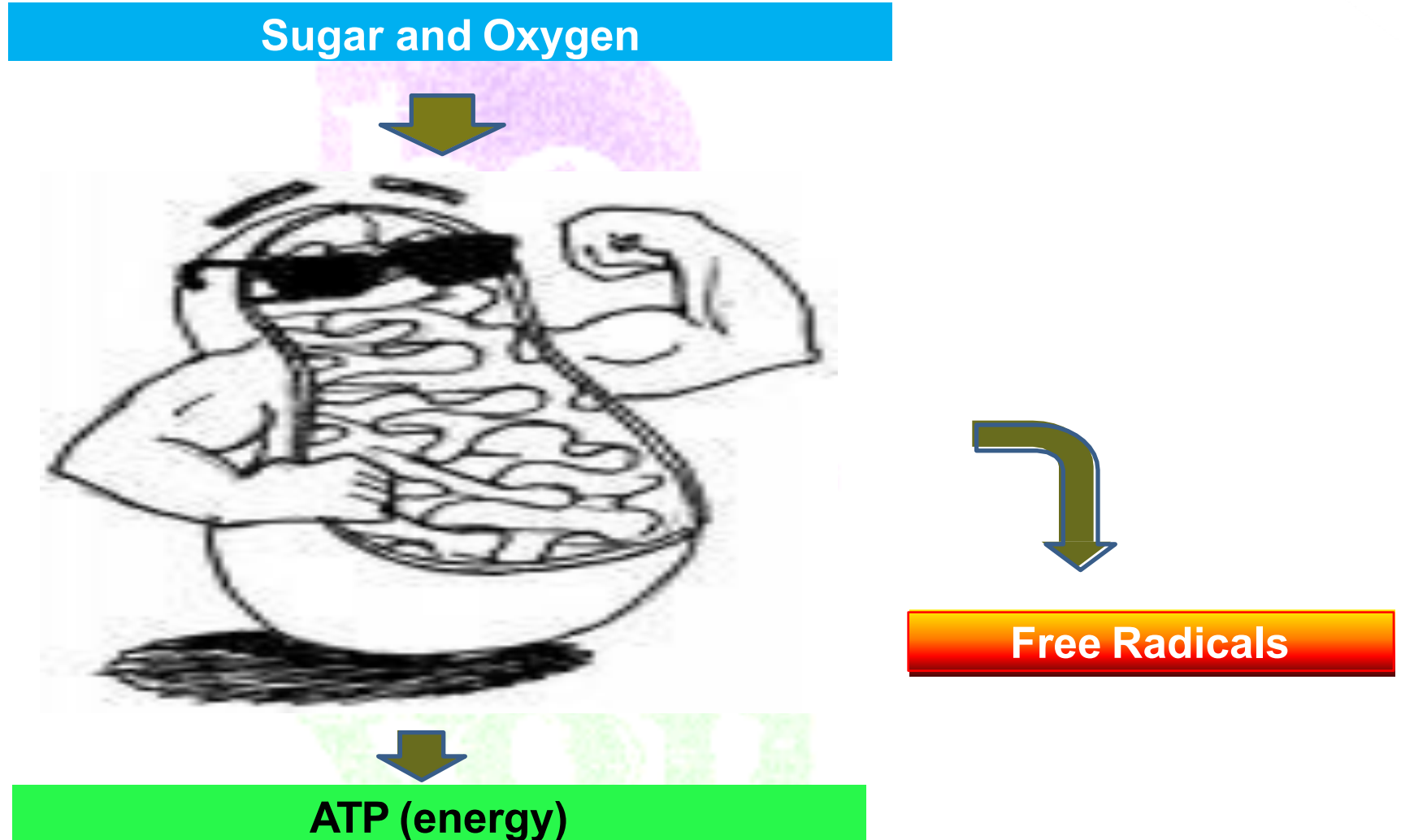
Nutrients Needed for ATP Production

- ✓ B Vitamins
- ✓ Amino Acids
- ✓ CoQ10
- ✓ Magnesium
- ✓ Carnitine
- ✓ Ribose (made in body)

If not enough nutrients or low in oxygen, we generate less ATP from each glucose!



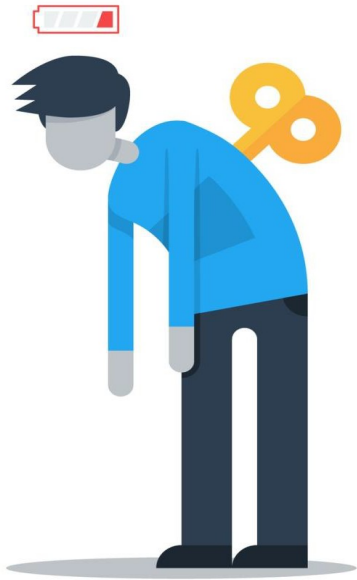
Mitochondria: The Power House of The Cells



Why You Need Glucose?

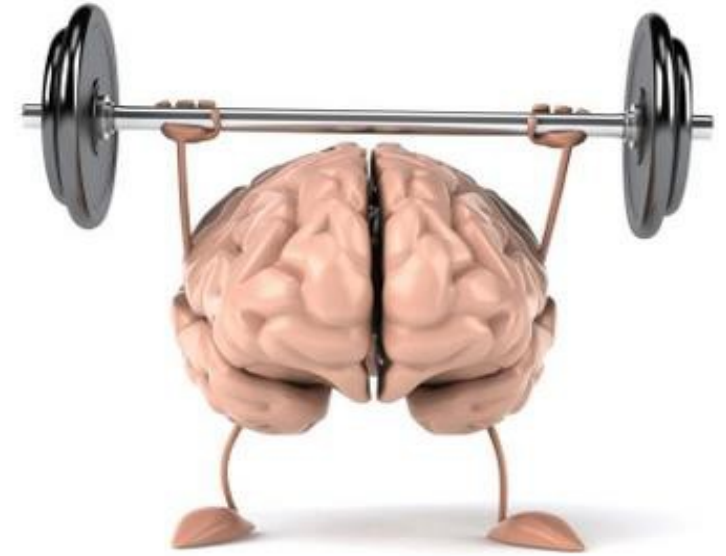
✓Energy

- For optimal cellular growth and repair
- For gland and organ function
- For mental clarity, attention, focus ⁽¹⁴⁾
- For steady moods
- For having fun
- For meaningful relationships
- For achieving success in your chosen career



Exercise and Your Brain

- ❑ Get started and gradually increase duration
- ❑ Effective antidepressant in many people ([15](#), [16](#))
 - ✓ Weight lifting
 - ✓ Walking
 - ✓ Cardio (Hiking, jogging, cycling, running, playing sports, etc)
 - ✓ Yoga
- ❑ Oxygenates and nourishes the brain



- Consumes ~20% of glucose ([17](#))
- Made up of ~75% water
- Fattest organ ~ 60% fat
- Uses 20% of total oxygen

“Do not exchange what you want
the most for what you want in the
moment!”

Experiences + Beliefs = Thoughts

We do NOT build habits by NOT doing ‘x, w, z’

We build habits when we DO ‘x, w, z’

GET STARTED!



What's Your Why?

Thank You!



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References

1. Samantha K. Hutchison, Nigel K. Stepto, Cheryce L. Harrison, Lisa J. Moran, Boyd J. Strauss, and Helena J. Teede. [Effects of Exercise on Insulin Resistance and Body Composition in Overweight and Obese Women with and without Polycystic Ovary Syndrome.](#) The Journal of Clinical Endocrinology & Metabolism. 2011 Apr, 30, Vol 96, Issue 1.
2. Hamer M, Sabia S, Batty GD, Shipley MJ, Tabák AG, Singh-Manoux A, Kivimaki M. [Physical activity and inflammatory markers over 10 years: follow-up in men and women from the Whitehall II cohort study.](#) Circulation. 2012 Aug 21;126(8):928-33. doi: 10.1161/CIRCULATIONAHA.112.103879. Epub 2012 Aug 13.
3. Richter EA1, Hargreaves M. [Exercise, GLUT4, and skeletal muscle glucose uptake.](#) Physiol Rev. 2013 Jul;93(3):993-1017. doi: 10.1152/physrev.00038.2012.
4. Kramer, Volek et al. [Influence of exercise training on physiological and performance changes with weight loss in men.](#) Med. Sci. Sports Exerc., Vol. 31, No. 9, pp. 1320-1329, 1999.
5. John A Babraj, Niels BJ Vollaard, Cameron Keast, Fergus M Guppy, Greg Cottrell, and James A Timmons. [Extremely short duration high intensity interval training substantially improves insulin action in young healthy males.](#) BMC Endocr Disord. 2009; 9: 3. Published online 2009 Jan 28.
6. Ryder JW1, Chibalin AV, Zierath JR. [Intracellular mechanisms underlying increases in glucose uptake in response to insulin or exercise in skeletal muscle.](#) Acta Physiol Scand. 2001 Mar;171(3):249-57.
7. Godfrey, R., Madgwick, Z., & Gregory, P.W. (2003). [The Exercise-Induced Growth Hormone Release in Athletes.](#) Sports Medicine: 33 (8).
8. Kanaley JA, Weltman JY, Veldhuis JD, Rogol AD et al. [Human growth hormone response to repeated bouts of aerobic exercise.](#) J Appl Physiol. 1997 Nov;83(5):1756-61
9. Tabata I¹, Nishimura K, Kouzaki M, Hirai Y, Ogita F, Miyachi M, Yamamoto K. [Effects of moderate-intensity endurance and high-intensity intermittent training on anaerobic capacity and VO₂max.](#) Med Sci Sports Exerc. 1996 Oct;28(10):1327-30.

References (Continued...)

10. Tabata I¹, Irisawa K, Kouzaki M, Nishimura K, Ogita F, Miyachi M. [Metabolic profile of high intensity intermittent exercises](#). Med Sci Sports Exerc. 1997 Mar;29(3):390-5.
11. Nobuyuki Miyatake, Hidetaka Nishikawa, Akie Morishita, Mie Kunitomi, Jun Wada, Hisao Suzuki, Kayo Takahashi, Hirofumi Makino, Shohei Kira, Masafumi Fujii. [Daily walking reduces visceral adipose tissue areas and improves insulin resistance in Japanese obese subjects](#). Diabetes Research and Clinical Practice, November 2002 Volume 58, Issue2, Pages 101-107.
12. Kunio Yamanouchi, MD, PHD, Takashi Shinozaki, MD, PHD, Kiwami Chikada, MD, PHD, Toshihiko Nishikawa, MD, Katsunori Ito, MD, Shoji Shimizu, D, Norihito Ozawa, MD, Yoichiro Suzuki, MD, Hitoshi Maeno, MD, PHD, Katsumi Kato, MD, PHD, Yoshiharu Oshida, MD, PHD and Yuzo Sato, MD, PHD. [Daily Walking Combined With Diet Therapy Is a Useful Means for Obese NIDDM Patients Not Only to Reduce Body Weight But Also to Improve Insulin Sensitivity](#). Diabetes Care 1995 Jun; 18(6): 775-778.
13. Kam K. [The truth about the hormone leptin and obesity](#). WebMD.Online.
14. Philipp Mergenthaler, Ute Lindauer, Gerald A. Dienel, and Andreas Meisel. [Sugar for the brain: the role of glucose in physiological and pathological brain function](#). Trends Neurosci. 2013 Oct; 36(10): 587-597. Published online 2013 Aug 20.
15. Weir, Kristen. [The exercise effect](#). American Psychological Association. December 21, Vol 42, No. 11.
16. James A. Blumenthal, PhD; Michael A. Babyak, PhD; Kathleen A. Moore, PhD; W. Edward Craighead, PhD; Steve Herman, PhD; Parinda Khatri, PhD; Robert Waugh, MD; Melissa A. Napolitano, MA; Leslie M. Forman, MD; Mark Appelbaum, PhD; P. Murali Doraiswamy, MD; K. Ranga Krishnan, MD. [Effects of Exercise Training on Older Patients With Major Depression](#). JAMA Internal Medicine, October 25, 1999, Vol 159, No. 19.