

METABOLIC SYNDROME (METS)

EXERCISE

What Type

How Much

Barriers

SUNLIGHT

Direct Benefits in MetS

Influential Benefits Applicable to MetS

FRESH AIR / OUTDOORS

Influence on Exercise

Influential Benefits Applicable to MetS

SUSTAINABILITY AND RELATIONSHIP TO TRUST IN GOD

Know Your Team

Group

Claim Promises

Metabolic Syndrome - Exercise, Sunlight, Fresh Air

If those who are sick would exercise their muscles daily, women as well as men, in outdoor work, using brain, bone, and muscle proportionately, weakness and languor would disappear. Health would take the place of disease, and strength the place of feebleness.

Rising above their aches and pains, let them engage in useful employment suited to their strength. By such employment and the free use of air and sunlight, many an emaciated invalid might recover health and strength.

Ministry of Healing 246.



Metabolic Syndrome- Exercise

65 women (elderly) with Metabolic Syndrome, 12 month study. Half exercise training, half control. Improvement in the study group vs control especially as related to:

- Total Body Fat
- Trunk Fat
- Hip Circumference
- Triglycerides
- HDL-C

* not as much change in glucose, hsCRP, blood pressure.



Metabolic Syndrome- Exercise

Longitudinal study, ~17.5 years, Men, age 30-59. Sedentary, Moderate Activity, High Activity (training with expenditure >2000 kcal/week ~ 300 kcal daily)

*160 pound male walking 3.5 mph burns about 314 kcal in 1 hour

Training with exercise expenditure > 2000 kcal/week which results in maintenance of good aerobic capacity level is a strong protective factor in development of obesity and metabolic syndrome in middle-aged men.



BRINGING UP MY HDL

For every 1 mg/dL decrease in HDL,
2-3% increase in heart disease.



BRINGING UP MY HDL

2007 Japanese Meta-analysis
(study looking at several studies)
found that **duration** of exercise had
more to do with increasing HDL than
intensity or frequency of exercise.
20 minutes with added benefit for
each 10min added.

Goal 1 hour per day (broken up
20min)



What Type of Exercise?

Metabolic Syndrome - Aerobic Training

Aerobic Training had greater ability to reduce visceral (more dangerous) adipose tissue, improve weight loss.



Metabolic Syndrome - Resistance Training

Korean Study over 6000 participants, evaluated in year 1 and 2 of the study looking at muscle to fat ratio and indicators of metabolic syndrome.

Low-ratio group had higher values for all indicators of metabolic syndrome as compared to the high-ratio group



Metabolic Syndrome - Resistance Training

One meta-analysis 2010. Patients with obesity related impaired glucose tolerance and Type II DM. Randomized CT, Resistance Training (dose response involving intensity, duration, frequency).

Reduced:

A1C, Fat mass, Systolic Blood Pressure

Did not statistically affect:

HDL, TG, LDL, diastolic blood pressure



Metabolic Syndrome - Resistance Training

A study by the same author looking at duration of Resistance Training (RT) found that while 1 bout of RT and even 12 weeks (3 months) of RT did not show significant change in markers of MetS, 4 months into RT showed significant change in markers including TG, HDL, and additionally, total cholesterol and HDL.



Metabolic Syndrome - Aerobic + Resistance

Aerobic Training combined with Resistance Training had greater impact on visceral adipose tissue, maintaining lean mass, insulin metabolism (even in those without diabetes), decrease insulin resistance, improve blood flow and HDL.



How much?

Metabolic Syndrome- Exercise

Moderate Intensity Aerobic Activity (defined differently in different studies but here meaning an expenditure of 300Kcal daily, aerobic).

60 minutes daily

*Those who had >300 min per week of exercise were able to maintain weight loss more. (45 min- 7 days a week, 1 hour-5 days)

Activity spread throughout the day is also beneficial. But obese individuals require additional 2000-6000 steps a day depending on the degree of fitness and obesity.



Other Indirect Benefits of Exercise on MetS

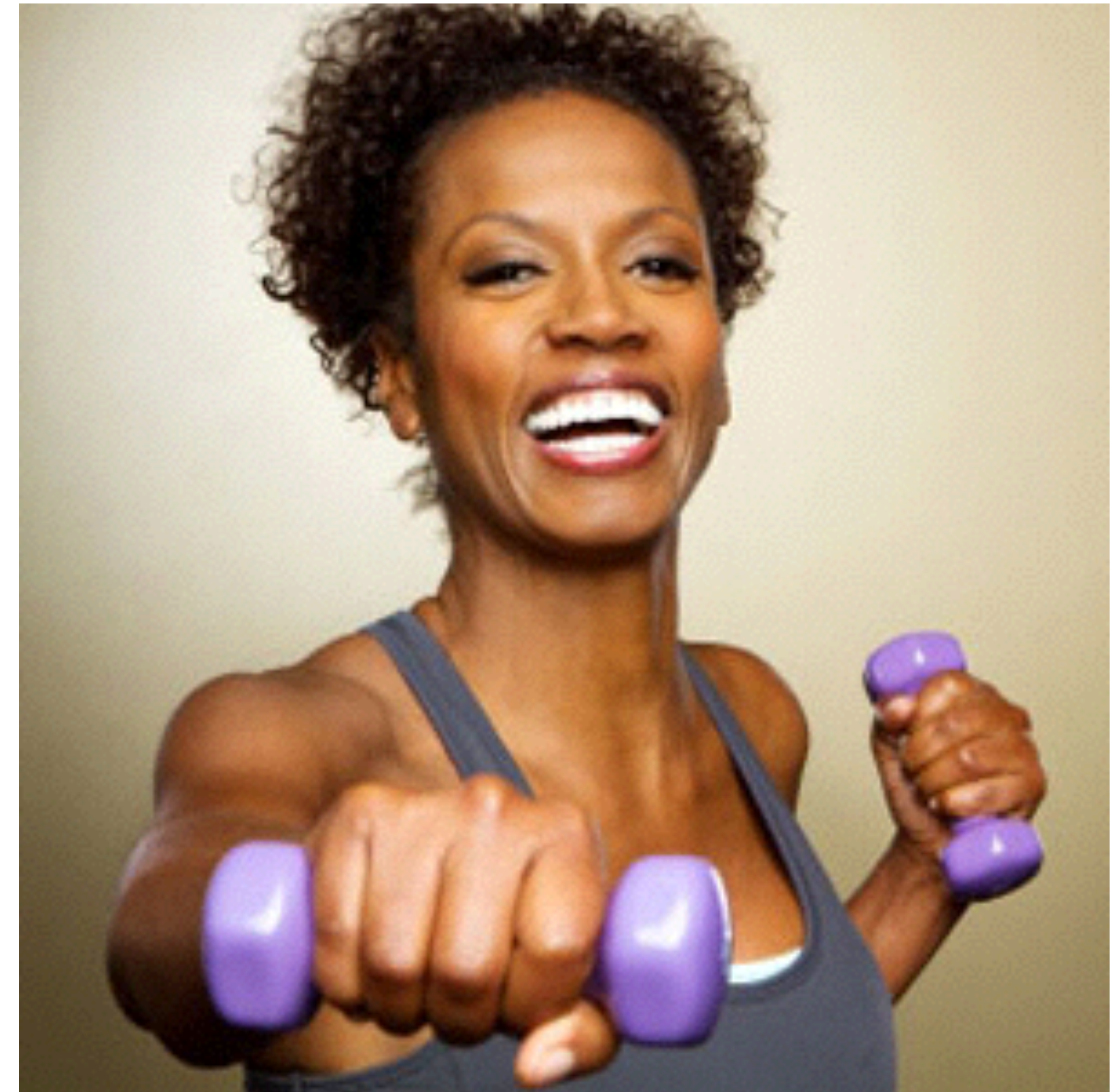
Reduction in falls, injury, pain especially associated with osteoarthritis and fibromyalgia independent of weight loss.

Improvement in depression scores, willingness to participate in other lifestyle interventions.

Improvement in learning.

Improvement in digestion.

Strength (Resistance) Training reduces injury, especially morbidities that prevent exercise.

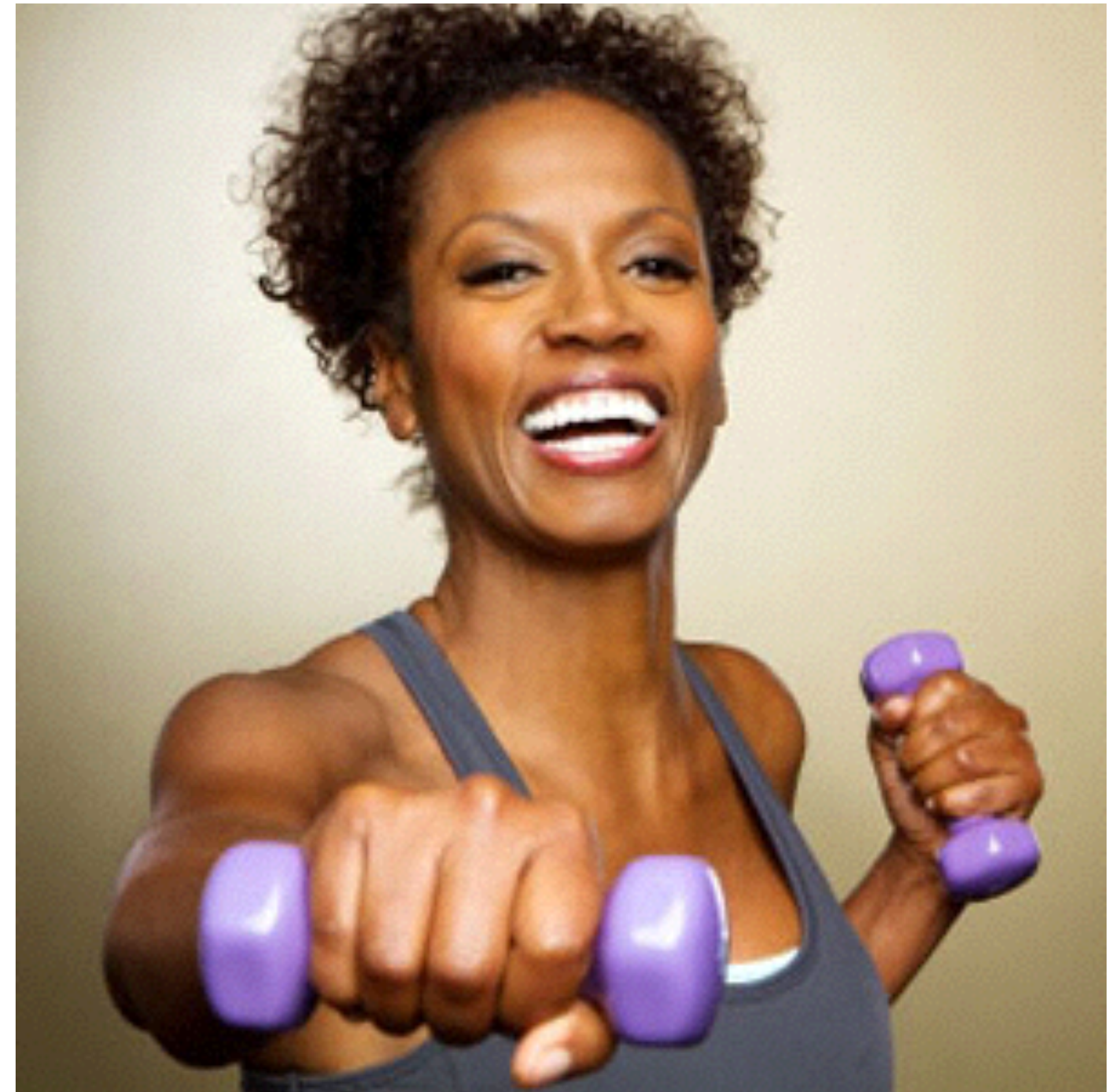


Other Factors to Consider in Maintenance of Exercise MetS

Icing after Exercise for 20 minutes can prevent the delayed pain and stiffness.

Endurance in Exercise is significantly improved when a patient is :

- well hydrated before and throughout the exercise
- he/ she is consuming high healthy complex carbohydrate regimen





**METABOLIC
SYNDROME
&
SUNLIGHT**

Metabolic Syndrome- Sunlight

UVA radiation the skin 24 human subjects increased circulating nitric oxide (release rather than production)

- Vasodilation
- Lowered blood pressure



Metabolic Syndrome- Sunlight

Swedish Cohort Study (1990-2002)

30% lower risk of Diabetes in those with the greatest sun exposure.

*of note those with highest risk reduction also had the lowest BMI

sunlight exposure and glucose metabolism?



Metabolic Syndrome- Sunlight

Long-term sub-erythemal and erythemal UVR significantly suppressed:

- weight gain
- glucose intolerance
- insulin resistance
- nonalcoholic fatty liver disease measures
- serum levels of fasting insulin, glucose, cholesterol

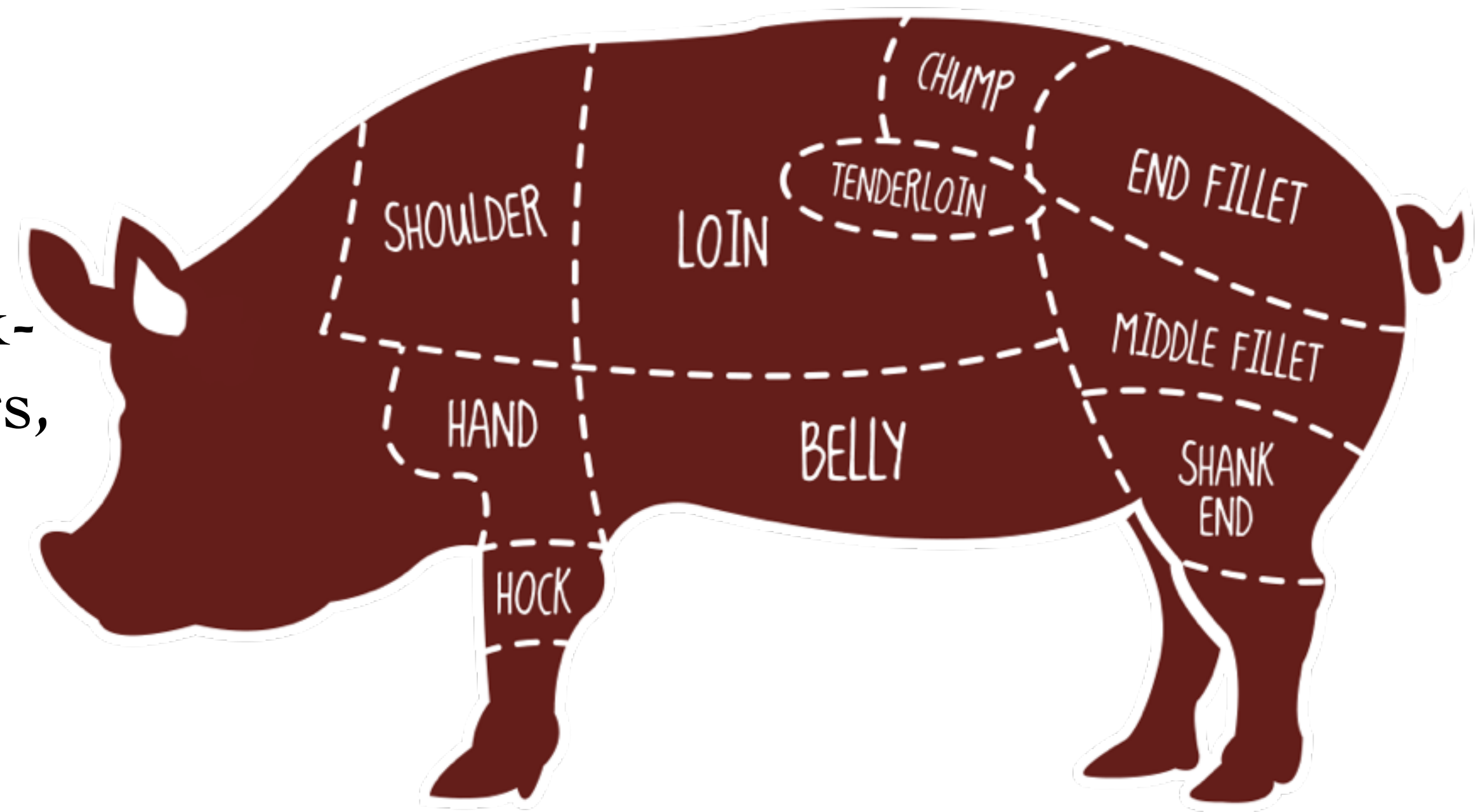
Independent of Vitamin D supplementation



Outdoor Exercise - Buffer?

“Those who eat freely of pork can not but be diseased. Those who have much outdoor exercise do not realize the bad effects of pork-eating as those do whose life is mostly indoors, and whose habits are sedentary, and whose labor is mental.”

RH June 20, 1899, Art. B



Metabolic Syndrome- Sunlight

UV radiation has been demonstrated to produce beta endorphins via hair follicles and sweat glands of the skin.



Exercise, Fresh Air, Sunlight

"Melancholy and depression will leave them. The fresh air and sunshine, and the exercise taken, will bring them life and vitality. The wearied brain and nerves will find relief. Good treatment and a wholesome diet will build them up and strengthen them. They will feel no need for health-destroying drugs or for intoxicating drink."

Letters to Sanitarium workers in Southern California.



Metabolic Syndrome- Sunlight/ Fresh Air

Systematic review, 11 trials, 833 participants, benefits outdoor activity as compared with indoor activity:

- greater feelings of revitalization
- increased energy and positive engagement
- decreases in tension, confusion, anger and depression
- greater enjoyment and satisfaction with outdoor activity
- more likely to repeat the activity at a later date **did not directly assess whether they did



Metabolic Syndrome- Sunlight/ Fresh Air

Canadian study evaluating the effect of outdoor vs indoor exercise various markers in post menopausal women. Marked improvement in the outdoor group a compared to the indoor group.

- post-exercise tranquility
- positive engagement
- adherence to exercise



Sustainability - The Statistics

Benefits of lifestyle changes are irrefutable but the unfortunate reality is that most people are more likely to continue a medication longer than they are to maintain lifestyle changes.



Sustainability

- Help your patient succeed



Sustainability

- Help your patient succeed
 - Help them identify their obstacles
 - Help them choose how to overcome
- Dialogue with others to find solutions



Know the Gifts of Your Staff

- 1 Cor 12

12- For as the body is one, and hath many members, and all the members of that one body, being many, are one body: so also is Christ.

22 Nay, much more those members of the body, which seem to be more feeble, are necessary:

28 And God hath set some in the church, first apostles, secondarily prophets, thirdly teachers, after that miracles, then gifts of healings, helps, governments, diversities of tongues.

29 Are all apostles? are all prophets? are all teachers? are all workers of miracles?

30 Have all the gifts of healing? do all speak with tongues? do all interpret?



Know the Gifts of Your Staff

- MA, CNA- obtain the information
- PA, NP- (Subspecialist, Hospitalists)
- Nurse Educator (Core Measures)
- Health Coach
 - Standardized Questionnaire that the MA, CNA, Health Coach can fill out the details- you follow up and encourage.
 - Cut and Paste the updates- Make it a part of your note (similar to updating medications).
 - Simple acknowledgements of improvement



MetS, Lifestyle Changes & Sustainability

Revelation 12:11

“They overcame by the blood of the lamb and by the **word of their testimony...**”

Hebrews 10:25

“Do not forsake the assembling of yourselves...”



MetS, Lifestyle Changes & Sustainability

Benefit of the Group

Help your patient track the improvements, give them measurable changes.

Remember the components of MetS.

Keep in Mind:

Inches before Weight

HDL goes down initially

Triglycerides go up initially



MetS, Lifestyle Changes & Sustainability Benefit of the Group

The power of the group can be written.

