

Patient Name:

Date:

Mitochondria: Recharging Immune Health

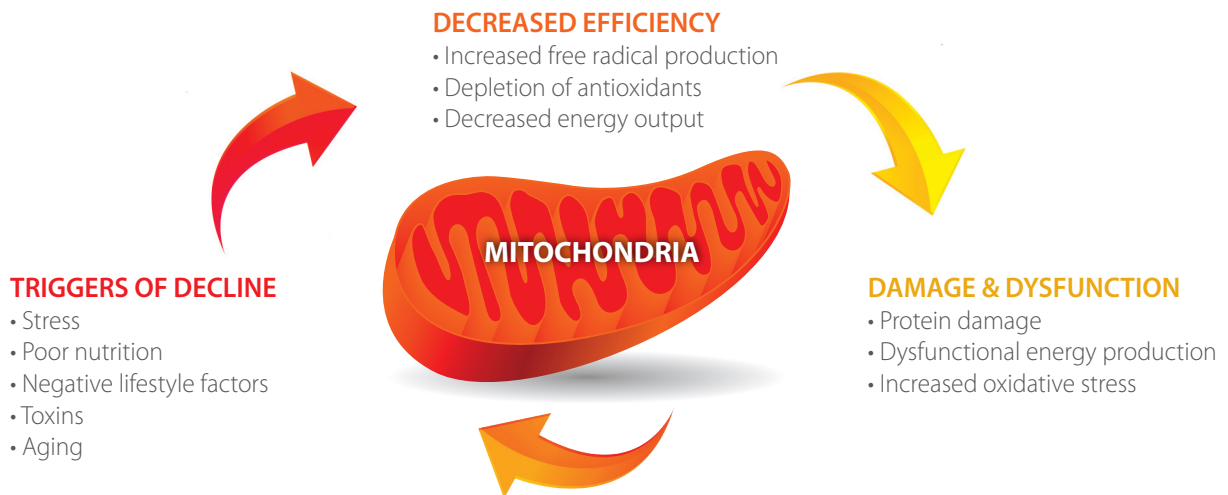
All organs and systems in the body rely on energy to function properly. Cellular energy is produced by mitochondria, which are organelles found in every cell in the body. These tiny structures generate over 90% of the body's energy, but this comes with a price—mitochondria also produce the vast majority of free radicals within the body. Free radicals cause oxidative damage, which hinders the function of our cells and contributes to inflammation and aging. In addition to producing energy, mitochondria sense danger when infections or toxins are present and are responsible for sending signals to surrounding cells.

ENERGY DEMAND IS HIGHEST IN THE:



Normally, dysfunctional mitochondria are removed to protect the cell from damaging consequences. However, aging, excess sugar in the diet, nutrient deficiencies, toxins, physical inactivity and stress can decrease the efficiency of mitochondria and impair this removal process. When mitochondria do not produce enough energy or create excessive oxidative stress, the systems relying on the metabolic reserve of energy begin to decline in function. Eventually, this dysfunction leads to noticeable symptoms and chronic disease.

THE VICIOUS CYCLE OF MITOCHONDRIAL DECLINE



MITOCHONDRIAL DYSFUNCTION HAS BEEN ASSOCIATED WITH:



Lifestyle Recommendations



Diet

Eat at least five to seven servings of brightly colored fruits and vegetables per day. A fasting period between dinner and breakfast will aid in repair.



Exercise

Exercise has been shown to stimulate the production of additional mitochondria to increase energy production. Aim for at least 45 minutes of exercise per day and prioritize weightlifting.



Sleep

Experts recommend seven to nine hours of sleep per night. To help with restful sleep, limit use of electronics before bed, and keep the bedroom dark and cool.



Limit Sugar

Excess sugars increase oxidative stress, deplete antioxidants and impair mitochondrial energy production. Do your best to restrict added sugars as much as possible.



Heat/Cold Therapy

Using extreme heat and cold like that in saunas or ice baths can induce mitochondrial repair. Even cold showers can be beneficial.

Nutrient Recommendations

Mitochondrial Support	Vitamins C & E Magnesium	Fish Oil (EPA + DHA)	CoQ10	Phosphatidylcholine
Acetyl L-carnitine helps to fast-track raw materials for energy production into the mitochondria. NAC is a key component of glutathione, a potent antioxidant. When combined with ALA, these nutrients act to combat oxidative stress and cellular damage.	Antioxidant vitamins C & E work to neutralize free radicals created from energy production. Magnesium is necessary for hundreds of reactions in the body and contributes to energy production.	EPA and DHA help control oxidative stress and inflammation. These essential fatty acids support overall mitochondrial function.	CoQ10 is an antioxidant, as well as an essential component of energy production pathways.	Phospholipids aid in cell signaling and the resolution of the inflammatory cycle.
ALC: 500 mg NAC: 600 mg ALA: 200 mg	Vitamin C: 250 mg Vitamin E: 50-800 IU Mg: 75-235 mg	4 g/day	100-300 mg/day	10 g/day

Recommendations:
