

6<sup>th</sup> ANNUAL

Functional  
Pharmacy  
Symposium



**FUNCTIONAL  
MEDICINE**

Continuing Education

# America the Vulnerable: Identifying the Immune Risks of Patients Who Walk into Our Pharmacy

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# Learning Objectives

- Discuss how polypharmacy, poor diet and lifestyle habits has increased the risk of SARS-CoV-2 infection in America
- Initiate the discussion about how nutrition and lifestyle are the keys to immune-rejuvenation and immune-protection
- Discuss the connection of nutrition and lifestyle to optimal immune function (Technician)

# Disclosures

- Mr. Robins is a consultant and speaker for Ortho Molecular Products

# America the Vulnerable

- 189 million Americans (57%) have received at least one dose of vaccine
- 163.9 million (49%) are fully vaccinated
- 39.7% of world population has had one dose
- Only 1.6% of people in low-income countries have received at least one dose
- At this writing, the LAMBDA variant is taking hold in California



# America the Vulnerable

- Unvaccinated people are not randomly distributed. They tend to be geographically clustered and socially connected.
- The Delta variant can be spread by vaccinated people.
- The Delta variant is extremely transmissible. Negating some community-level protection the vaccine has offered.
- My best guess is Covid is not going away anytime soon.

# Who is at Risk Walking in Your Pharmacy Door?

- Immunocompromised patients per CDC
  - Been receiving active cancer treatment for tumors or cancers of the blood
  - Received an organ transplant and are taking medicine to suppress the immune system
  - Received a stem cell transplant within the last 2 years or are taking medicine to suppress the immune system
  - Moderate or severe primary immunodeficiency (such as DiGeorge syndrome, Wiskott-Aldrich syndrome)
  - Advanced or untreated HIV infection
  - Active treatment with high-dose corticosteroids or other drugs that may suppress your immune response

# Immune Resiliency

# Who is at Risk Walking in Your Pharmacy Door?

## Drug Induced Nutritional Deficiencies that can affect Immune Response

- Vitamin A
- Vitamin D
- Vitamin E
- Vitamin K
- Vitamin B3
- Vitamin B9
- Vitamin B12
- Vitamin C



1. Praasad A Molecular Medicine 2008 May-Jun; 14(5-6): 353–357
2. Jovic T, et al Nutirents . 2020 Sep; 12(9): 2550.
3. Tam M, et al European Journal of Clinical Nutrition. 57, pages 1193–1197 (2003)
4. 4. Aranow K, J Investig Med.2011 Aug, 59(6); 881-886



# Who is at Risk Walking in Your Pharmacy Door?

## Drug Induced Nutritional Deficiencies that affect the Immune Response

Zinc

Magnesium

Calcium

Potassium

Gut Biome



# DIND and SAD nutritional fix

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Multivitamin take twice a day

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High quality fish oil that has 800mg of ACTIVE INGREDIENTS twice daily

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Chelated Magnesium 250-1000mg daily in divided doses

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Vitamin D3 5000iu daily

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High quality probiotic with at least 10-20 billion CFUs

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# The Standard American Diet

- “In summary, there is enough quality, direct human evidence to conclude that many of the dietary choices in today’s modern society appear to have harmful impacts on our immune system and likely on the immune system of our offspring...”



# Who is at Risk Walking in Your Pharmacy Door?

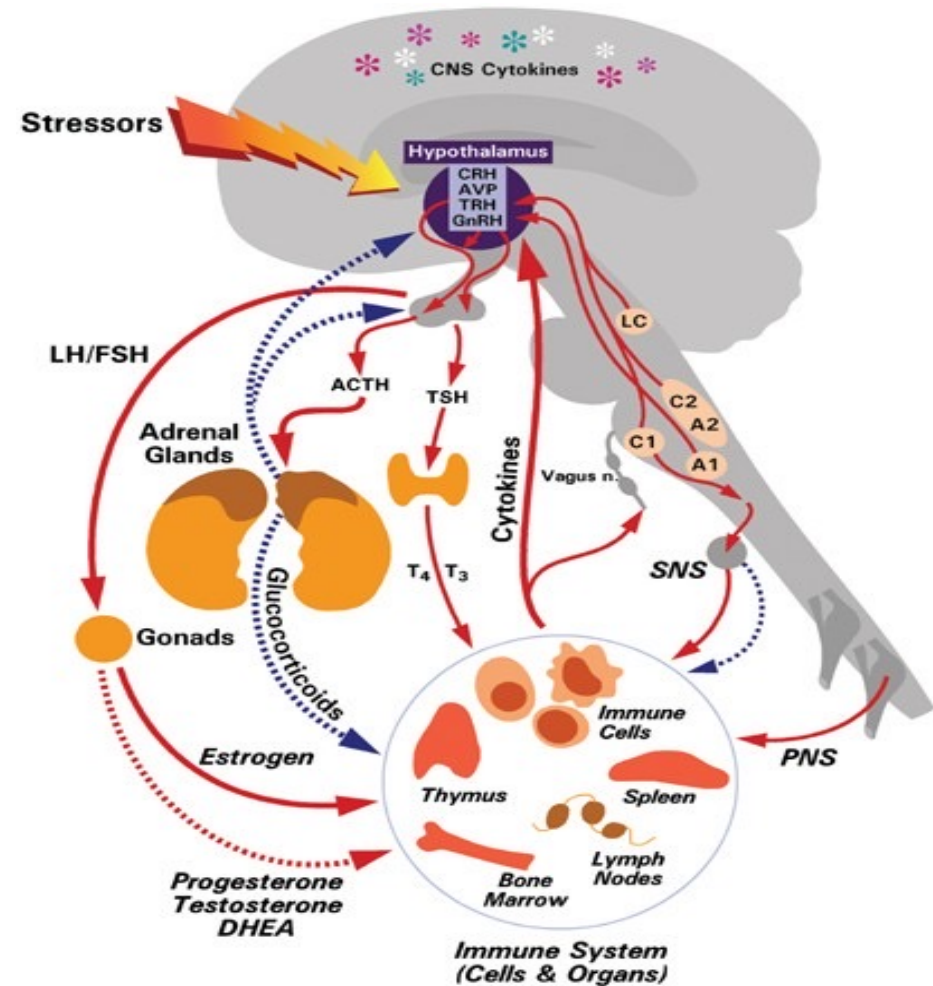
- **Stress**- Unemployed, under-employed, too employed
- Loneliness
- Kids at home, kids at school.
- To vaccinate or not.
- Shopping
- Being in groups





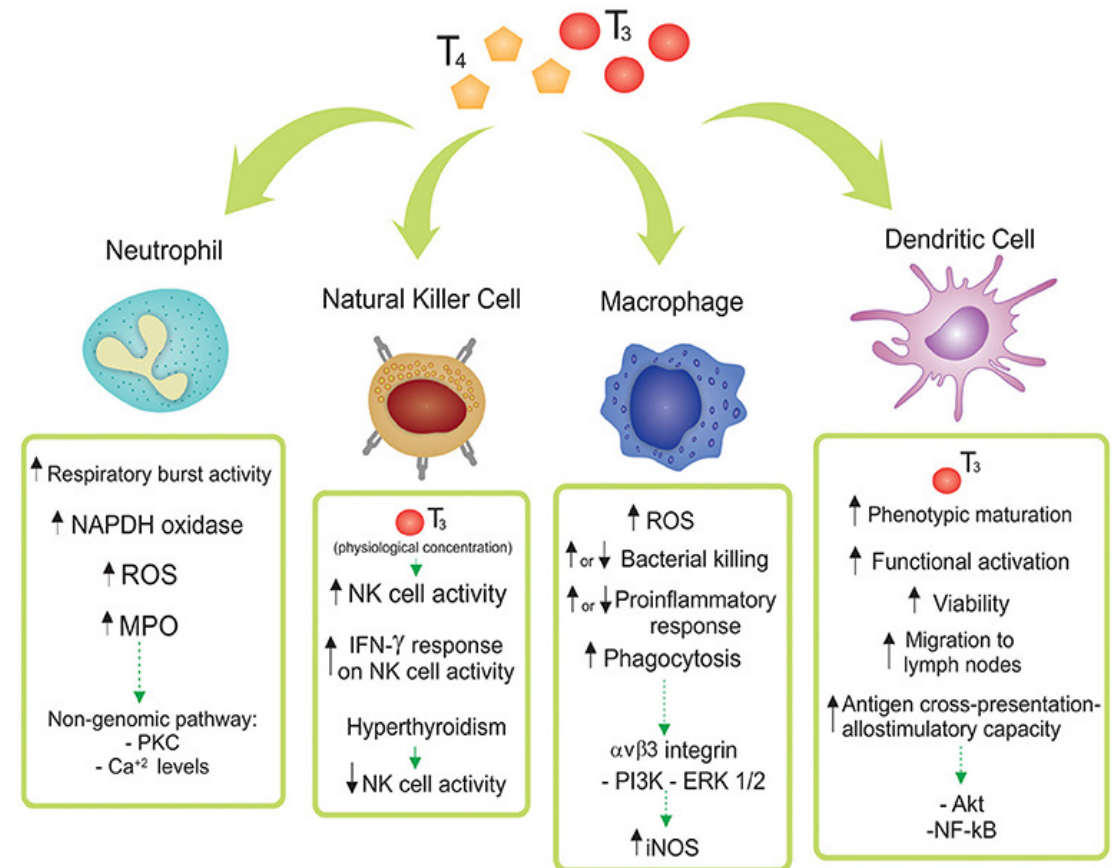
# The Effects of Chronic Stress on Our Patients

- "long-term stress suppresses or dysregulates innate and adaptive immune responses by altering the Type 1-Type 2 cytokine balance, inducing low-grade chronic inflammation, and suppressing numbers, trafficking, and function of immunoprotective cells. Chronic stress may also increase susceptibility to some types of cancer by suppressing Type 1 cytokines and protective T cells and increasing regulatory/suppressor T cell function"



# The Chronic Stress Experience of Our Patients

- **Endocrine imbalance**
  - **Thyroid imbalance** – Directly and indirectly affects the function of the immune system
  - Thyroid plays a role in both innate and adaptive immune responses.



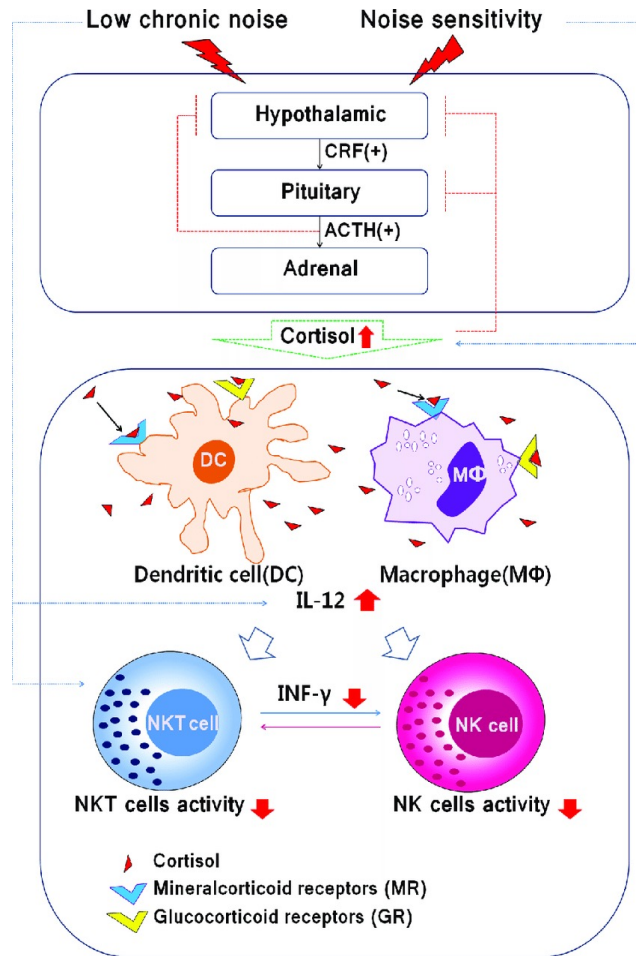
Front. Endocrinol., 04 June 2019

1. Klein J. Exp Biol Med. The Immune sys as a regulator of the thyroid 2006, March 231(3) 229-236
2. Diak T., Endocrinology. Immune cells and cytokine circuits.. 2008 Apr; 149(4): 1433–1435.

# For Thyroid to Function Properly we need:

- Zinc
- Selenium
- Iron
- Iodine
- Vitamin D3
- Vitamin A

# Endocrine Imbalance



- **Adrenal dysfunction** - secretory products of the adrenal glands (particularly glucocorticoids and catecholamines) tightly regulate cytokine expression, immune cell activation, and even bacterial proliferation



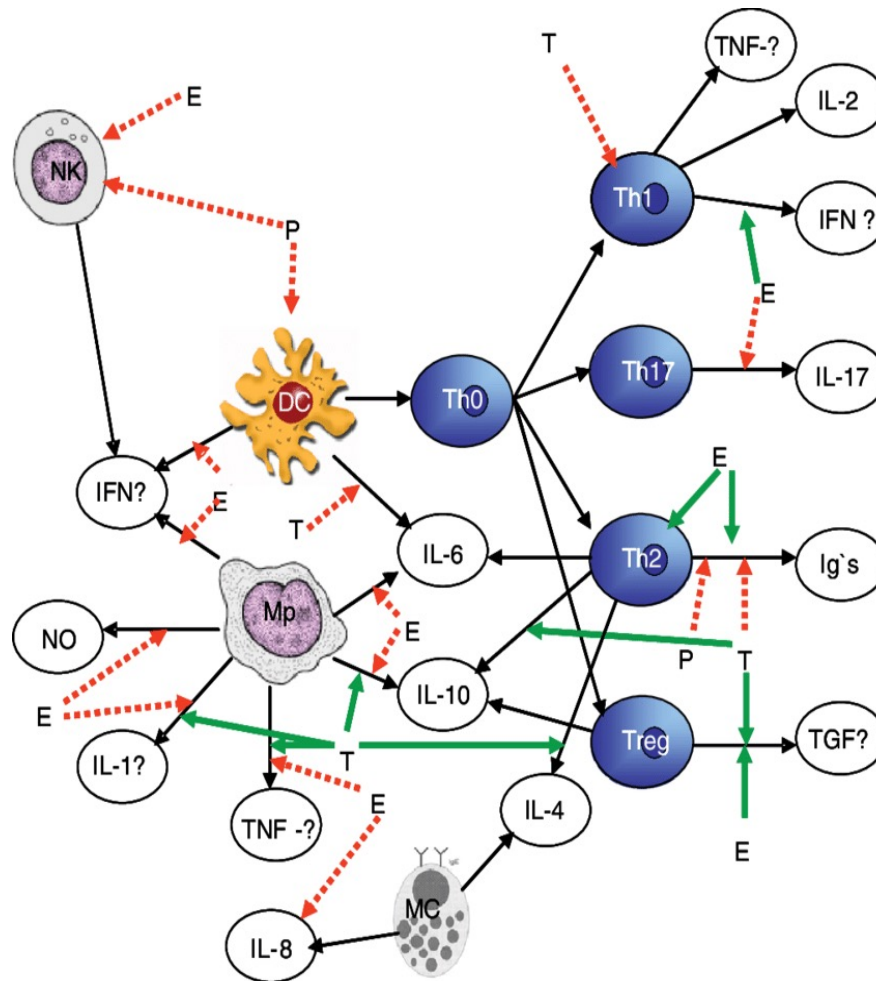
# Endocrine Imbalance

## Sex Hormone imbalance -

Testosterone- anti-inflammatory

Progesterone- anti-inflammatory

Estrogen- Pro-inflammatory

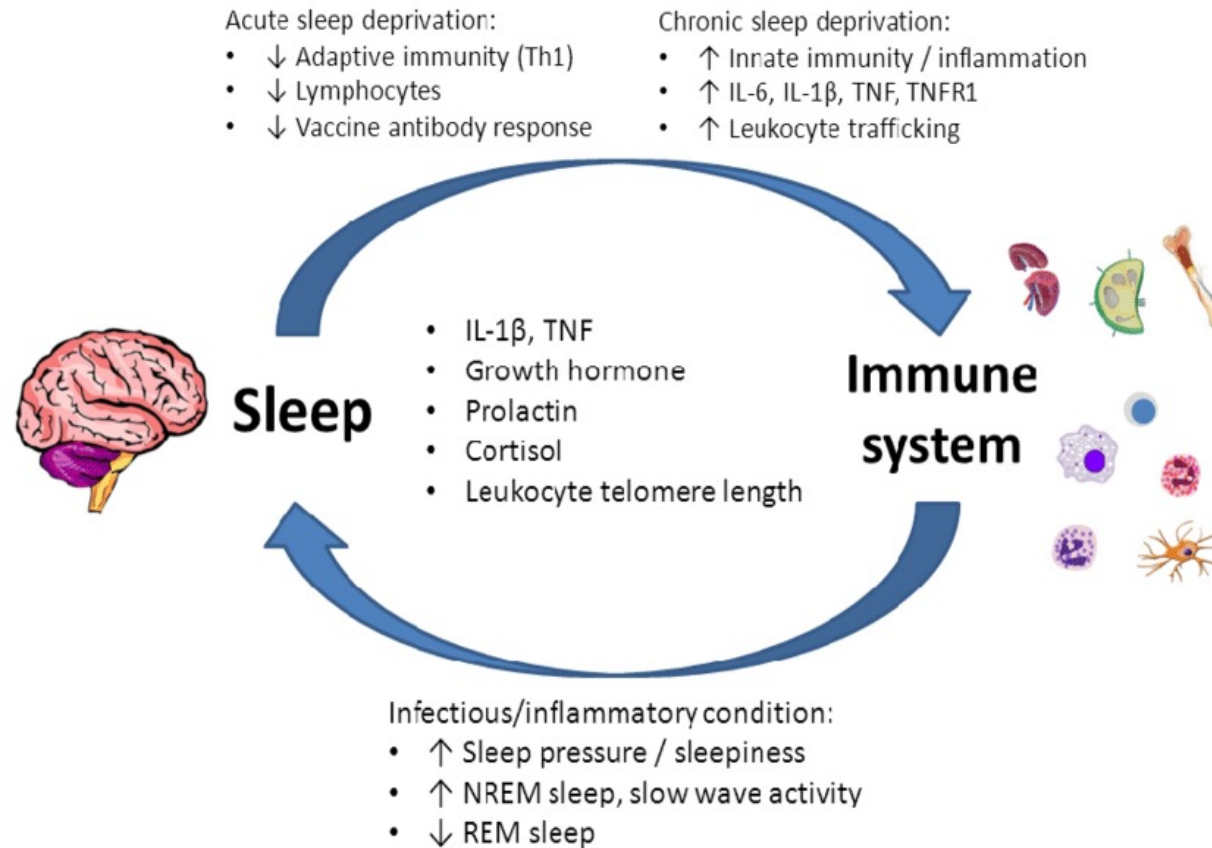


T: testosterone; P: progesterone; E: 17β-estradiol; DC: dendritic cell; Th0: T lymphocytes naive; Th1: CD4/CD8 lymphocytes; Th17: CD17 lymphocytes; Th2: B lymphocytes; Mp: macrophages; Treg: CD4<sup>+</sup>CD25<sup>+</sup>Foxp3<sup>+</sup> lymphocytes; NK: NK cell; MC: mast cell

Activation ———→  
Inhibition .....→

1. Kadel S. Et al Front Immunol Sex hormones regulate innate immune cells 2018; 9: 1653
2. Bini E et al Advances in Neuroimmune Biology 1 (2011) 163–177

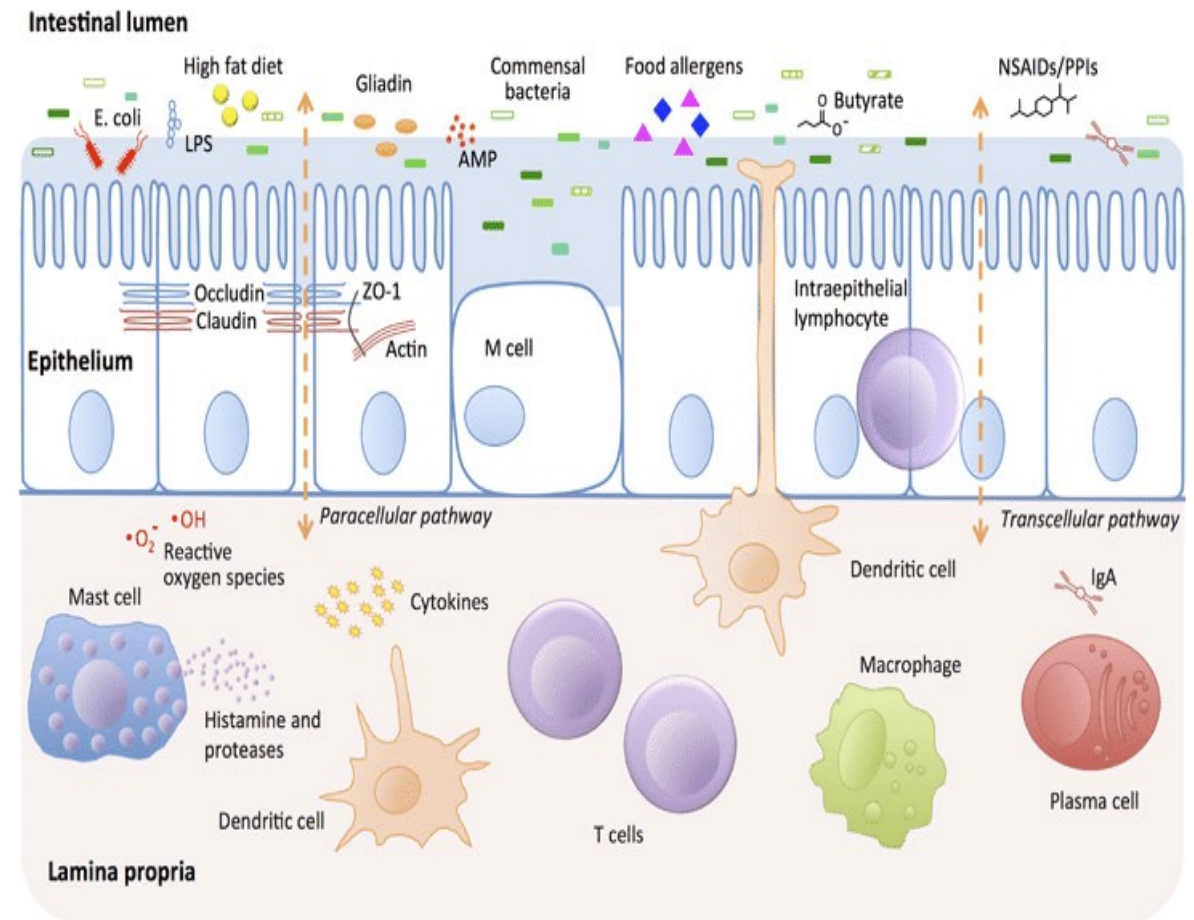
# Sleep Dysfunction



1. Zager. A. et al Neuroimmune aspect of sleep and wakefulness
2. Bini E et al Advances in Neuroimmune Biology 1 (2011) 163–177

# Dysbiosis and the Immune Response

- 70% of your immunity is in your gut
- The microbiota assist in immune function.
- If your body is busy putting out fires and repair a 60-foot-long gut. It will have little resources left to fight off other infections
- Chronic inflammation is thought to lead to Autoimmune diseases.



# Design a value-added service for your patients.



- *Immune consultations check ups*
  - *Check DINDs*
  - *Check dysfunction and disease affects on immune system*
- *Design personalized care plan*
  - *Nutrients*
  - *Food plan*
  - *Exercise*

Who are 3-5 patient's you can call on Monday to offer an immune consultation.

# Take-Aways

1. Take-Away 1- This pandemic is not going away anytime soon.
2. Take-Away 2-Most patient's diet and Rx drugs put their immune system at risk.
3. Take-Away 3 Name 3-5 patients you can assist with a "Immune check" on Monday.



# Self Assessment Questions

- What percentage of the American public eat the recommended 7 servings of fresh fruits and vegetables a day? 10%
- Do thyroid and adrenal function play a role in a healthy immune system? Yes
- Can inflammation increase for people with sleep problems? Yes
- What would be the best way to approach your patients about their immune resiliency?