



WEBINAR WEDNESDAY

EXERCISE AND DIET UPDATES FOR PEOPLE WITH MS

PRESENTED BY:

SANOFI GENZYME 

 Bristol Myers Squibb™

Genentech
A Member of the Roche Group

Janssen 
PHARMACEUTICAL COMPANIES
OF Johnson & Johnson

EMD Serono

How to Ask Questions During the Webinar:

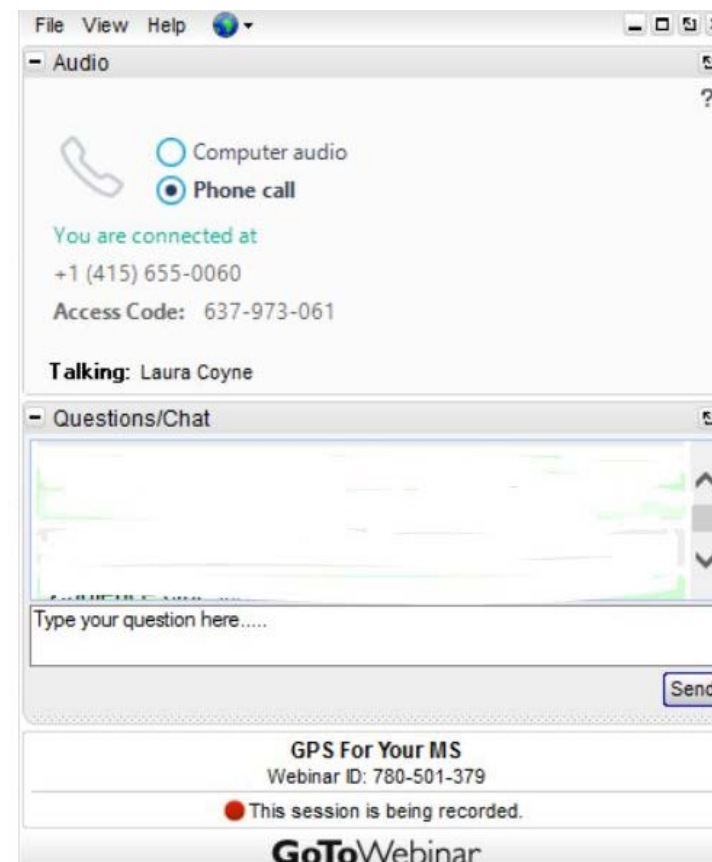
Type in your questions using the
Questions/Chat box

(If box is closed, click + to expand)



**Go-To-Webinar Attendee
Support Line:**

(877) 582-7011



Lynn Stazzone, RN, BSN, MSN, NP



Nurse Practitioner
Boston, MA

Alex Ng, PhD, FACSM



Exercise Physiologist
Milwaukee, WI

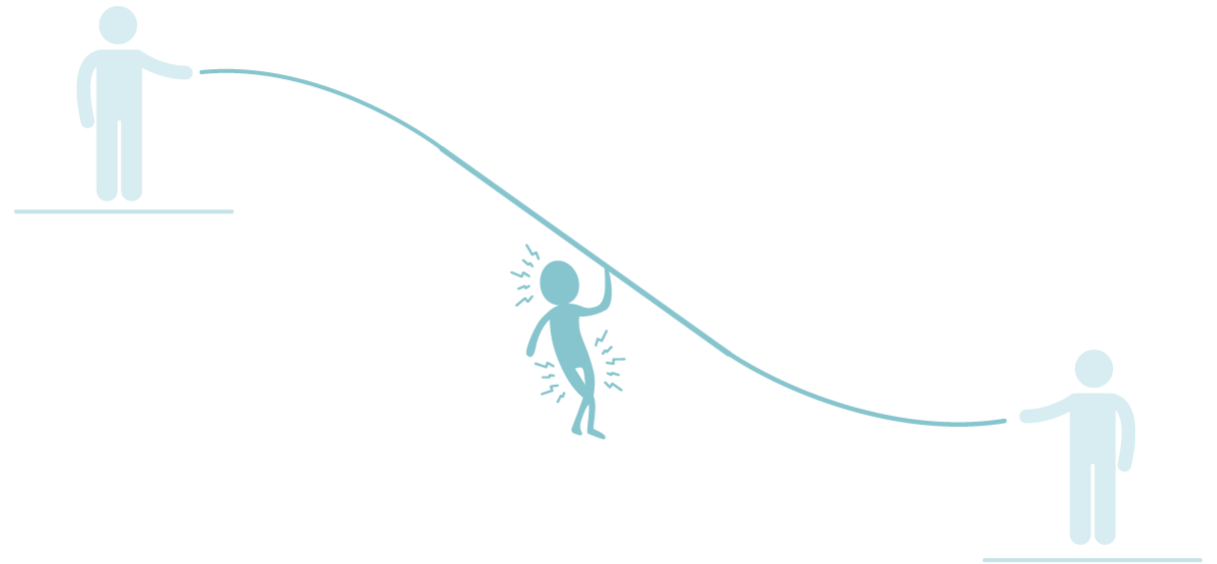
Learning Objectives

- Learn about the impact of the gut microbiome on MS and the role diet plays
- Recognize how exercise can improve function in MS
- Use current recommendations to start forming personal goals for diet and exercise

Holly and the MS Tightrope:

Holly is 40 and lives with MS. During quarantine Holly has picked up the following behaviors:

- Smoking
- Eating poorly: lots of processed foods
- No exercising: swimming pool closed and stuck inside
- Weight gain
- Fatigue
- Poor sleeping patterns



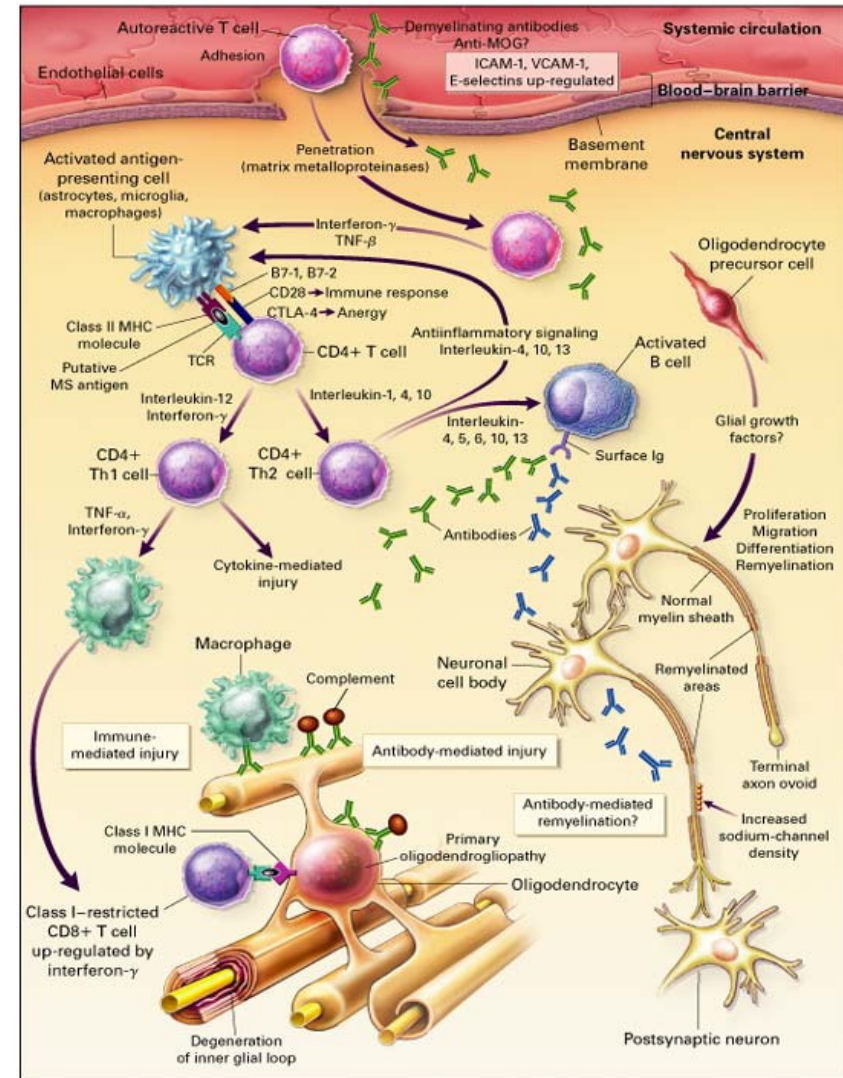
Learning Objective 1:
Learn about the impact of the gut microbiome on MS and the role diet plays

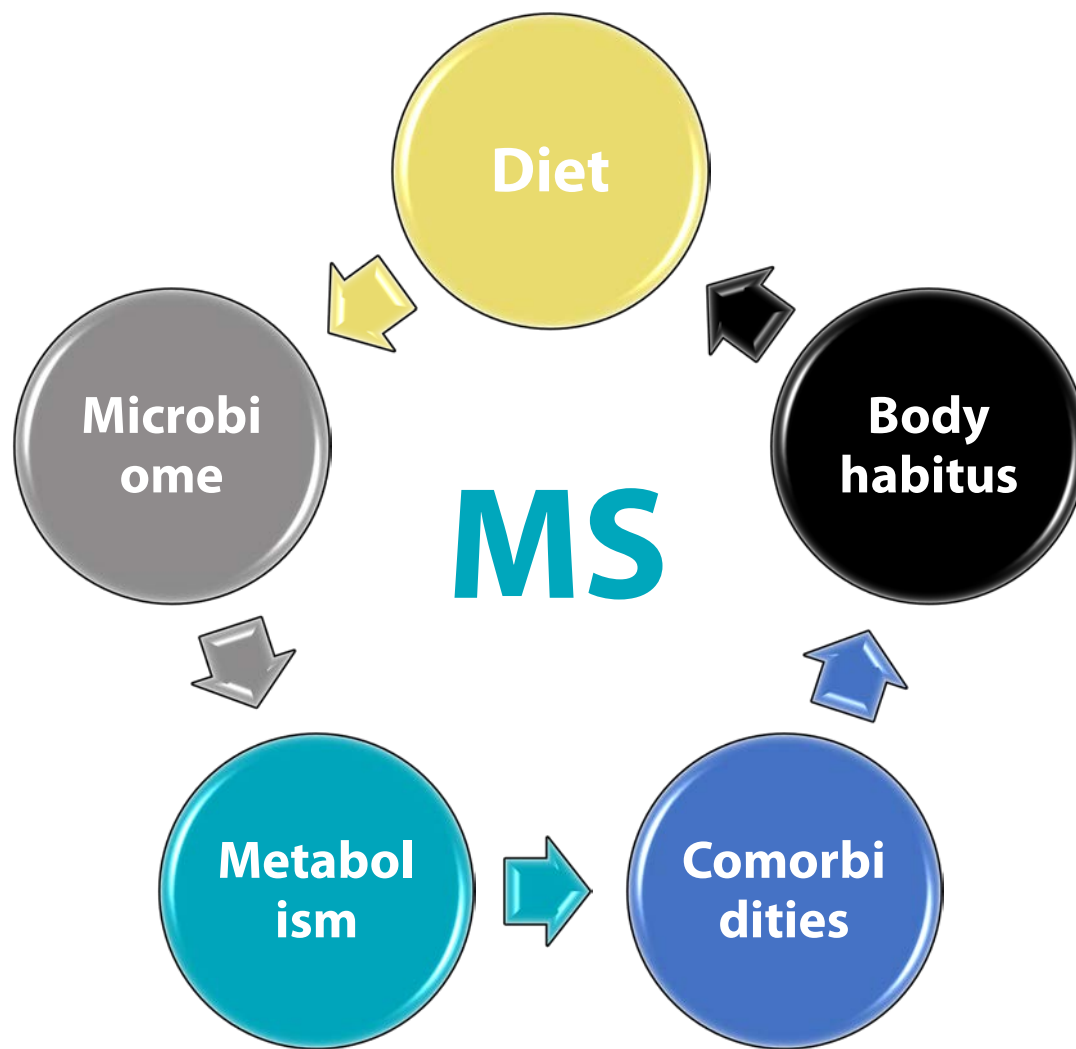
Food and Drug Administration:

- As of 2015, the agency regulates more than \$1 trillion in consumer products, including:
 - \$466 billion in food
 - \$275 billion in drugs
 - \$60 billion in cosmetics
 - \$18 billion in vitamin supplements

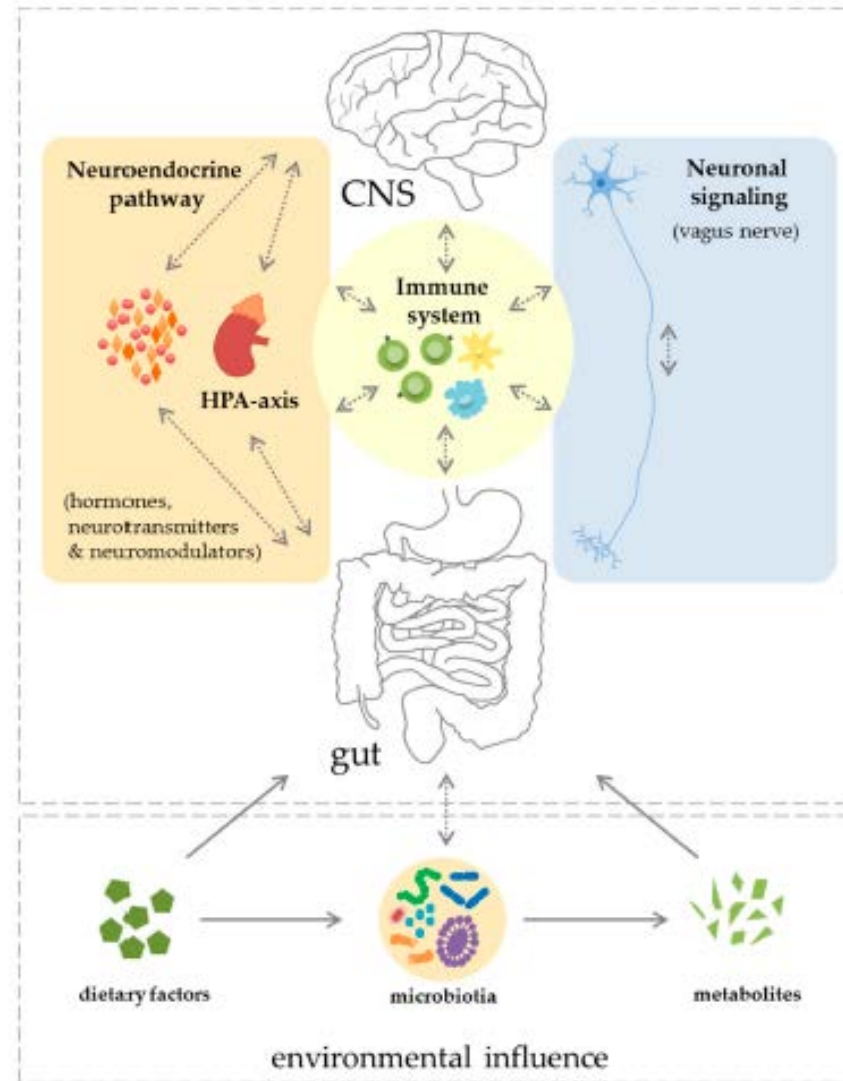
MS Cause and Effects:

- MS is caused by immune attack on the CNS (brain and spinal cord)
- Many branches of the immune system activated – T cells, B cells, macrophages
- Immune system attacks myelin
- Downstream effects on neurons, astrocytes
- 16+ disease modifying treatments approved for MS

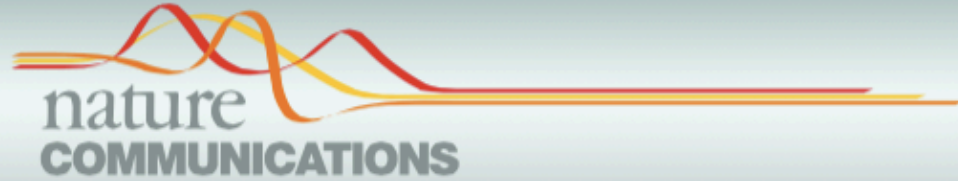




3 Ways the Gut Interacts with the Brain:



The Microbiome is Altered in MS



ARTICLE

Received 6 Sep 2015 | Accepted 20 May 2016 | Published 28 Jun 2016

DOI: [10.1038/ncomms12015](https://doi.org/10.1038/ncomms12015)

OPEN

Alterations of the human gut microbiome in multiple sclerosis

Sushrut Jangi^{1,*}, Roopali Gandhi^{1,*}, Laura M. Cox¹, Ning Li², Felipe von Glehn¹, Raymond Yan¹, Bonny Patel¹, Maria Antonietta Mazzola¹, Shirong Liu¹, Bonnie L. Glanz¹, Sandra Cook¹, Stephanie Tankou¹, Fiona Stuart¹, Kirsy Melo¹, Parham Nejad¹, Kathleen Smith¹, Begüm D. Topçuoğlu³, James Holden³, Pia Kivisäkk¹, Tanuja Chitnis¹, Philip L. De Jager¹, Francisco J. Quintana¹, Georg K. Gerber², Lynn Bry² & Howard L. Weiner¹



60 Multiple sclerosis
43 Healthy controls



Fecal DNA 60 MS
43 HC

Microbial 16s profiling
Roche 454
MiSeq Illumina



Sera 45 MS
16 HC
Mononuclear cells 18 MS
18 HC

Serologic analysis

Proliferation
cytokines

Gene expression
profiling



41 Multiple sclerosis
32 Healthy controls



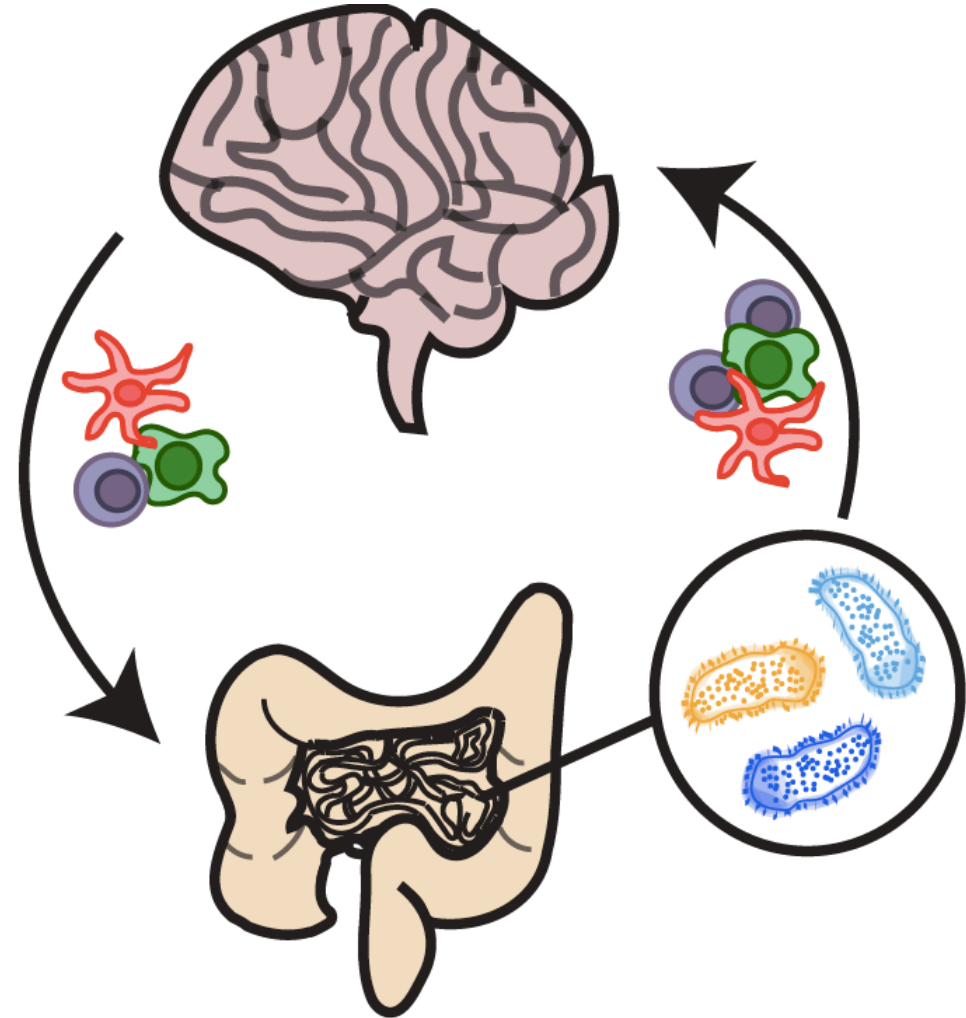
Breath 41 MS
32 HC

Methane
concentration

Subject demographics
Dietary survey
Disease characteristics

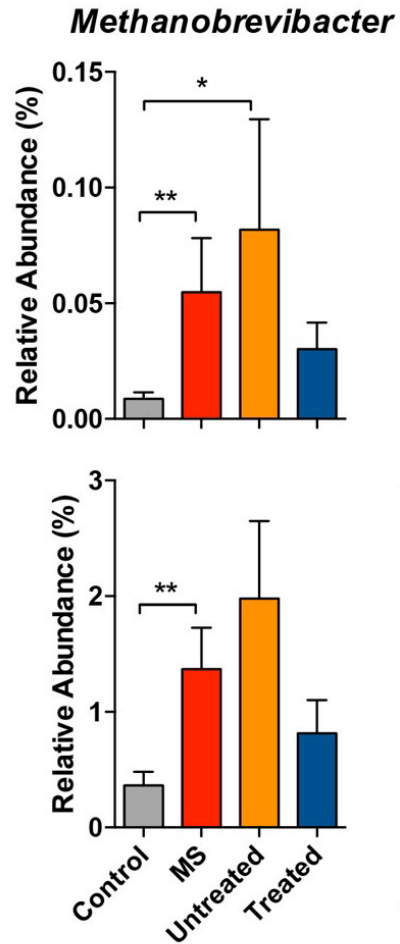
MS Microbiome and Peripheral Immune Response

- Altered Immune Responses
- TNF, IL-6, NF- κ B signaling increased in peripheral T-cells and monocytes
- Altered Gut Microbiome

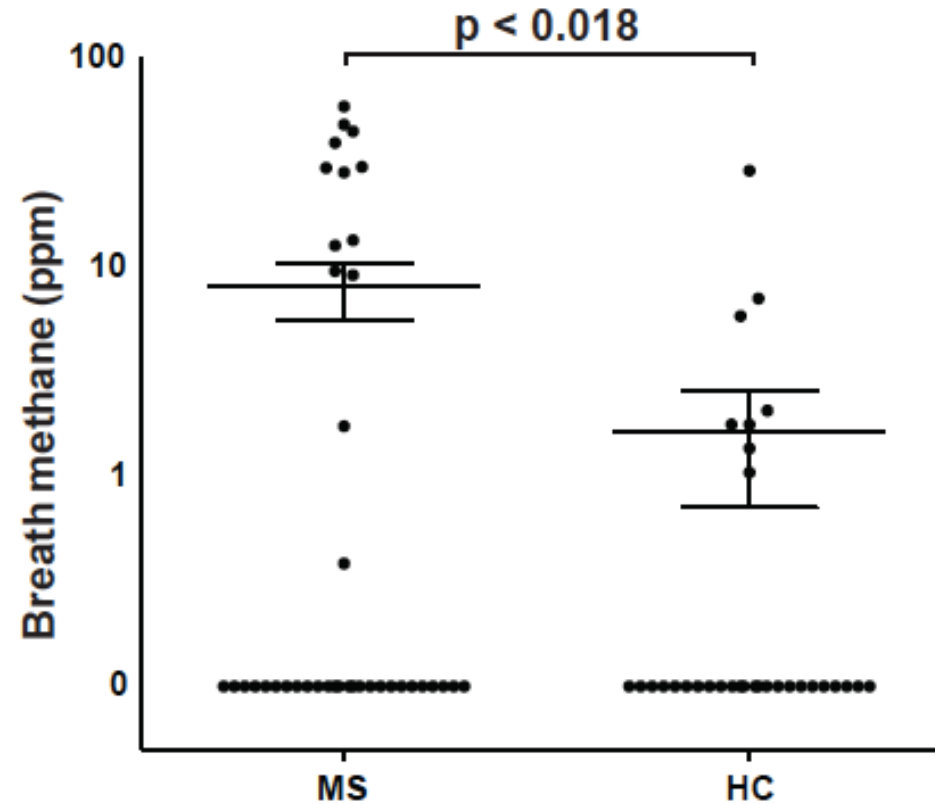


Methane Breath Test:

454



MiSeq

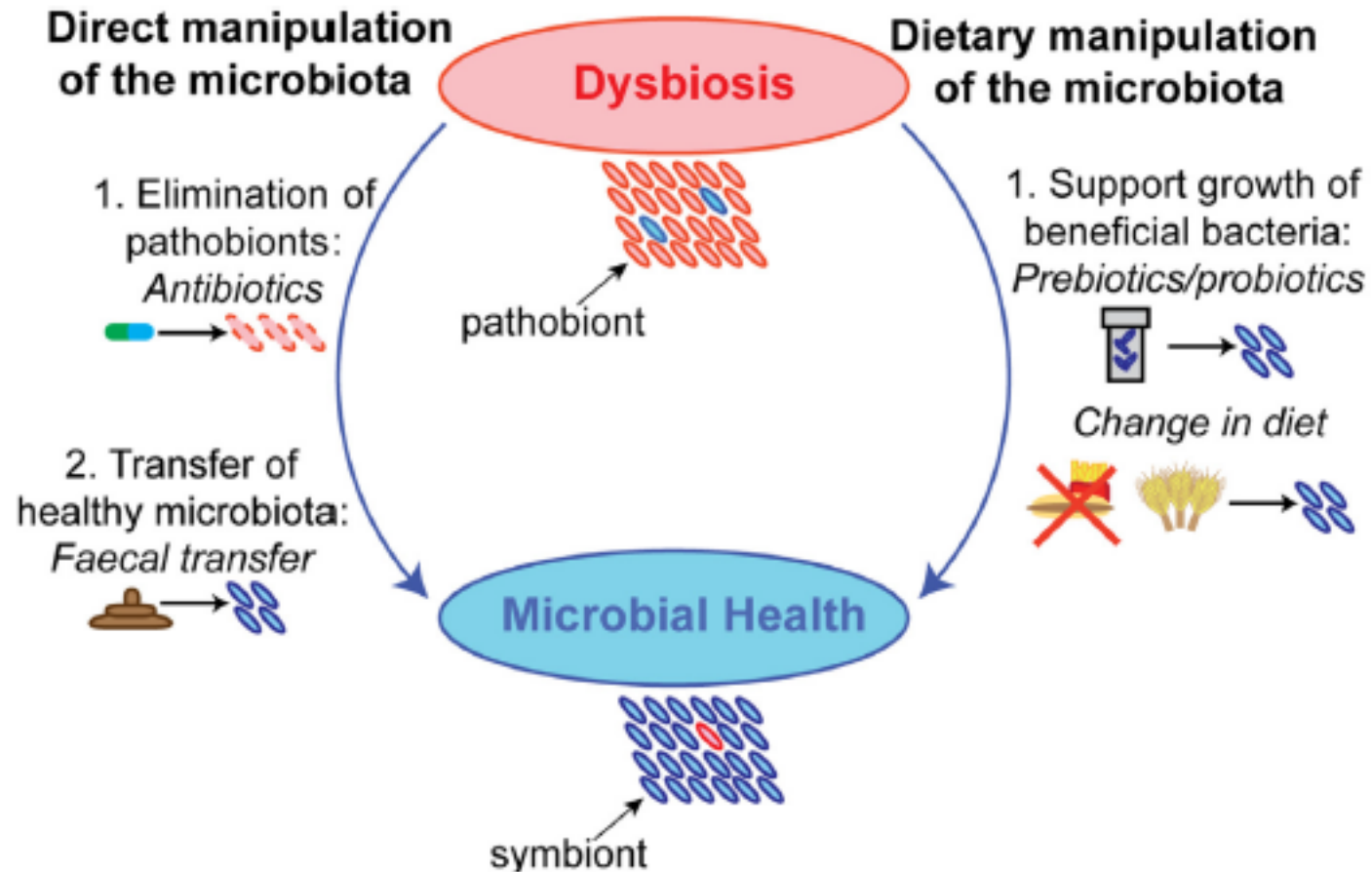


(S. Jangi et. al., Nat. Comm, 2016)

Summary MS Microbiome:

- *Methanobrevibacter* and *Akkermansia* which drive pro-inflammatory processes are increased in MS
- *Butyricimonas* is decreased in MS
- Treatment increases butyrate producers with normalization of gut microbiome
- MS patients had increased breath methane

Microbiome Directed Therapies:



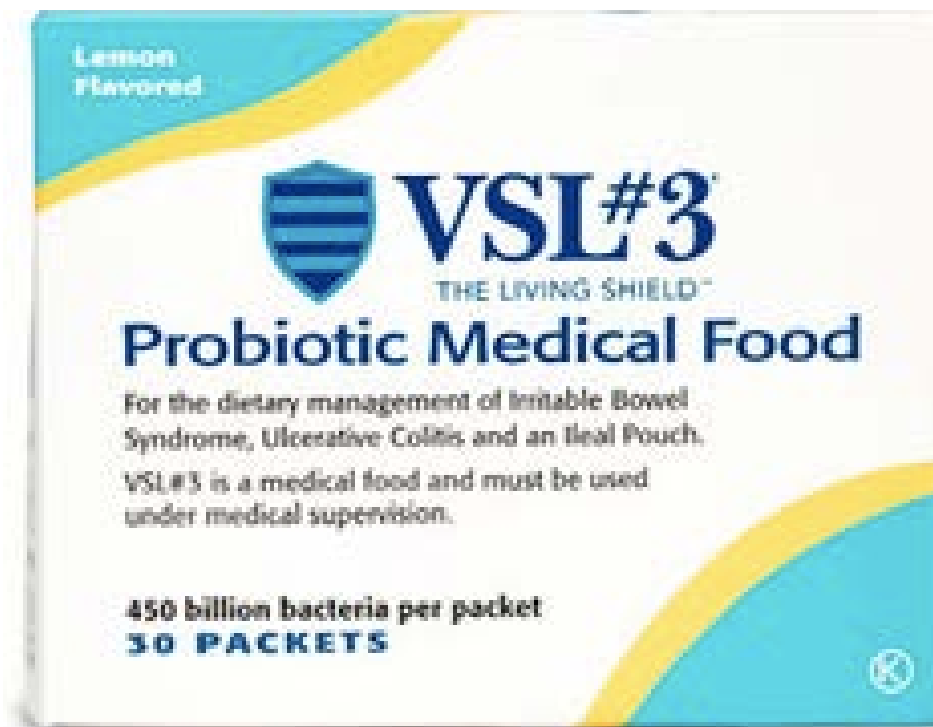
Microbiome-Directed Therapeutics:

- **Antibiotics** – target specific members or groups of the microbiome
- **Bacteriophages** – use naturally occurring bacterial viruses to target specific microbiota
- **Probiotics** – replace “missing” organisms
- **Multispecies/designer communities** – collection of organisms to replace a missing function
- **Prebiotics** – supply a complex food product to stimulate specific organisms
- **Synbiotics** – supply a complex of microbes + prebiotics
- **Nutritional therapy** – complete a redesign of a diet to promote beneficial microbial communities and function
- **Community replacement/microbiota restoration** – restore a deficient microbiota – fecal transplant

Probiotics Trial for MS: Partners MS Center, Brigham and Women's Hospital

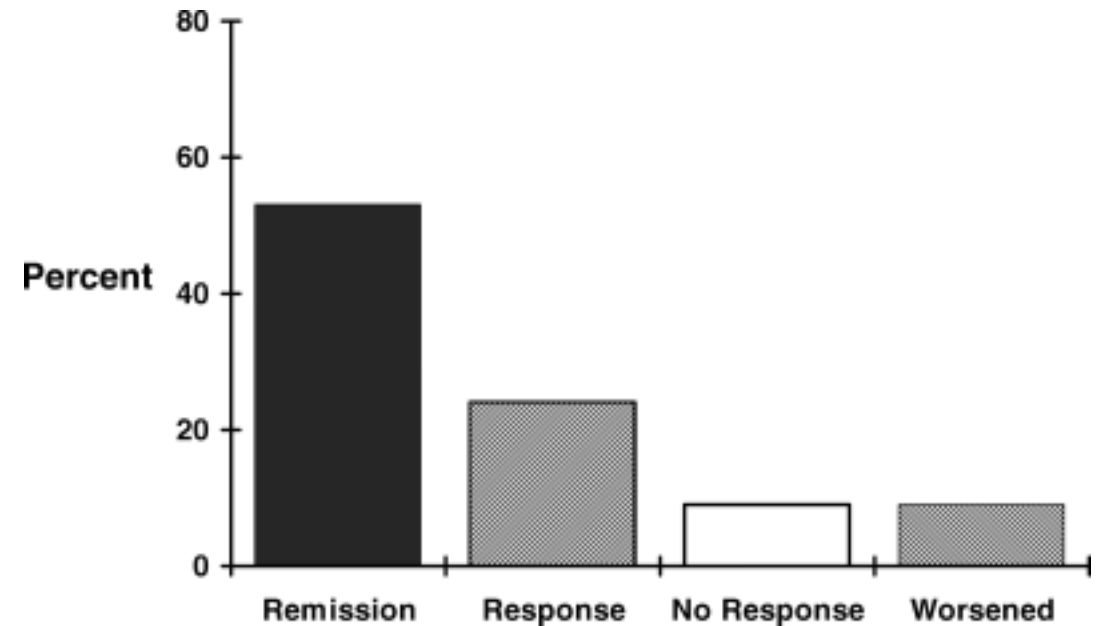
- Probiotics represent an oral, non-toxic treatment that induces Tregs, affects the microbiome, and could be used in combination with current MS therapy.
- Probiotic VSL#3 is efficacious in animal models of diabetes, colitis, and allergy via the induction of IL-10 regulatory T cells. In humans, VSL#3 has shown positive clinical effects in ulcerative colitis, irritable bowel syndrome and pouchitis.
- Authors: Stephanie Tankou, MD

Probiotics Used in Trial:



Probiotics Used in Trial Cont. and Results:

- Bifidobacterium
- Bifidobacterium
- Bifidobacterium
- Lactobacillus acidophilus
- Lactobacillus
- Lactobacillus paracasei
- Lactobacillus
- Streptococcus



Pilot trial of Probiotics in MS: Partners MS Center, Brigham and Women's Hospital

- MS subjects (n=9) and Controls (n=13) were orally administered VSL#3 double strength sachets twice daily (total 3,600 billion CFU/day) for two months (60 days).
- Blood and stool specimens were collected prior to, at discontinuation of therapy and 3 months thereafter.
- Frozen PBMCs were used for FACS analysis and gene expression studies.
- Stool samples underwent 16S profiling and metabolomics

Summary:

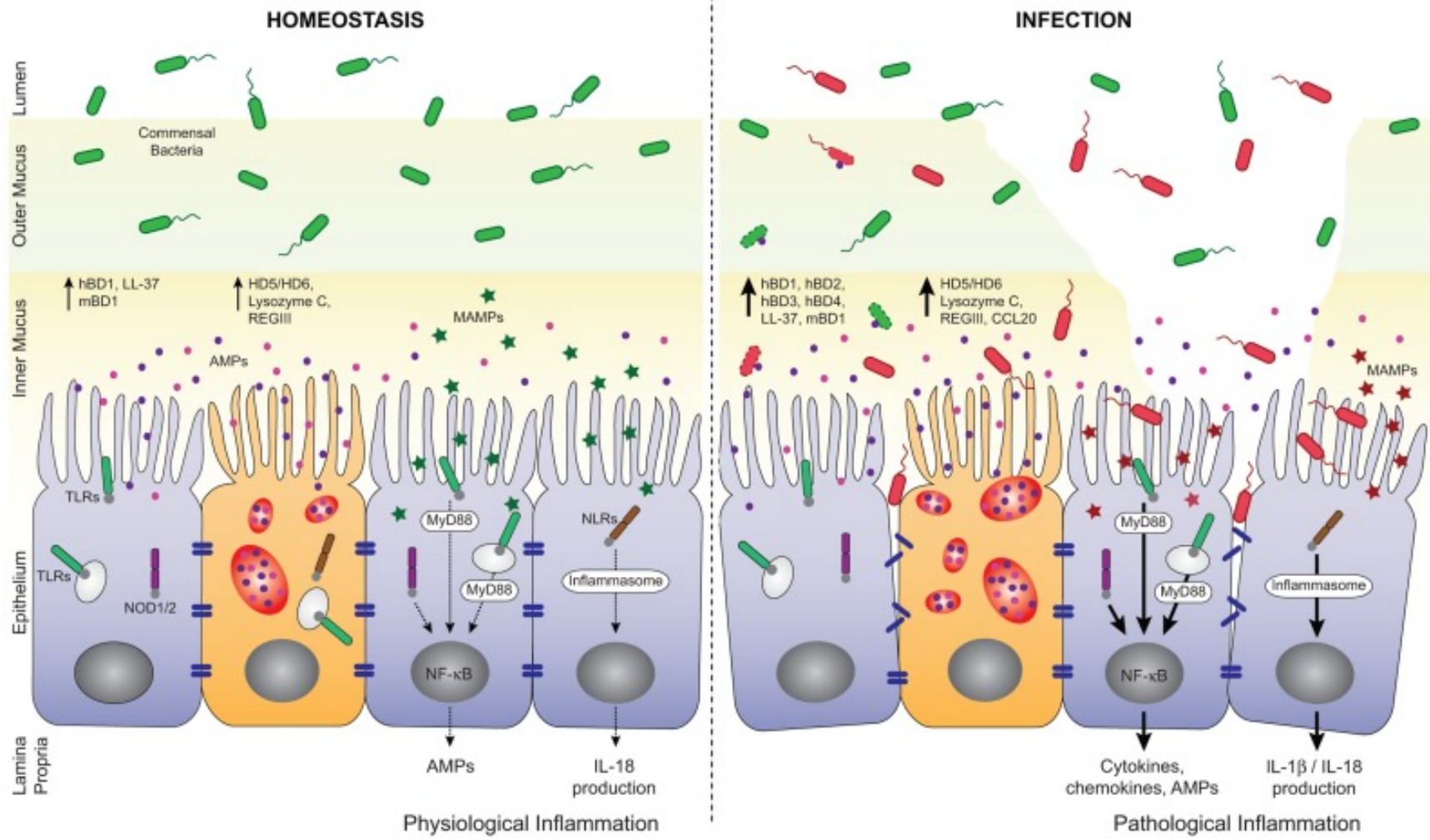
- Administration of VSL#3 was associated with an increase in the relative abundance of species related to VSL#3.
- VSL#3 for 2 months to HC and MS decreased pro inflammatory monocytes and the expression of activation markers on monocytes and dendritic cells.
- Discontinuation of VSL#3 was associated with decrease of CD39 and IL-10 T regulatory cells, down-regulation of LAP on PBMCs and increase of pro-inflammatory monocytes.
- VSL#3 was associated with change in stool metabolomics profile of HC and MS subjects.

Fecal Microbiota Transfer (FMT):



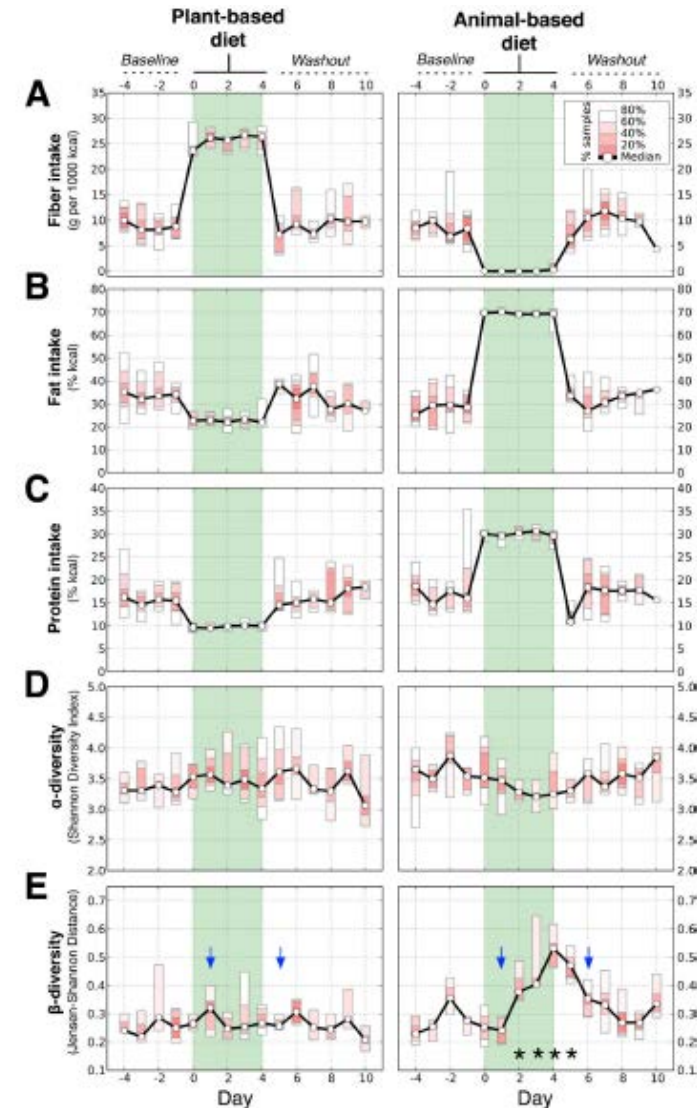
FMT: A Treatment for Recurrent C. Difficile Infection

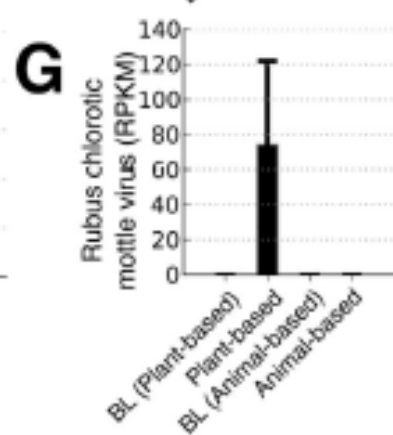
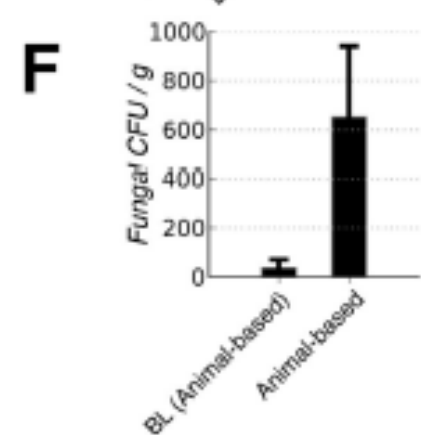
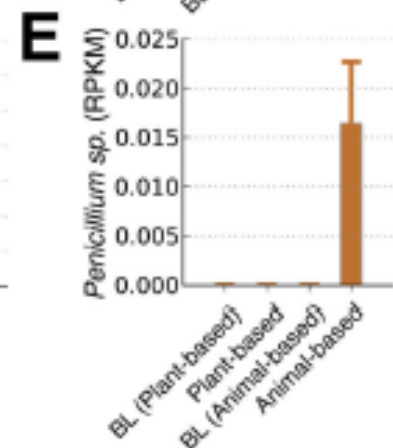
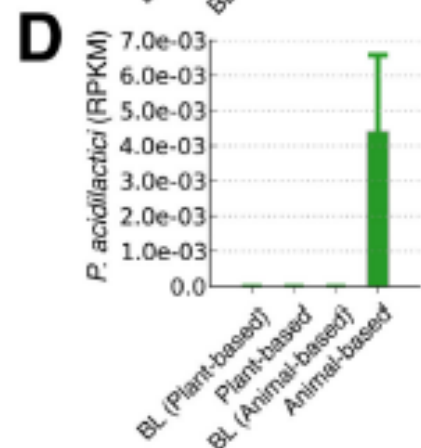
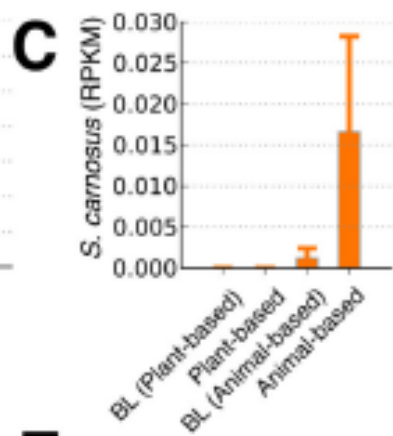
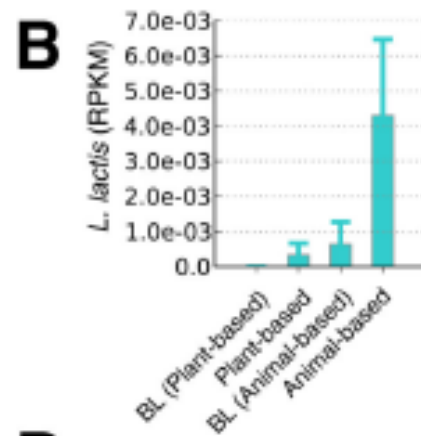
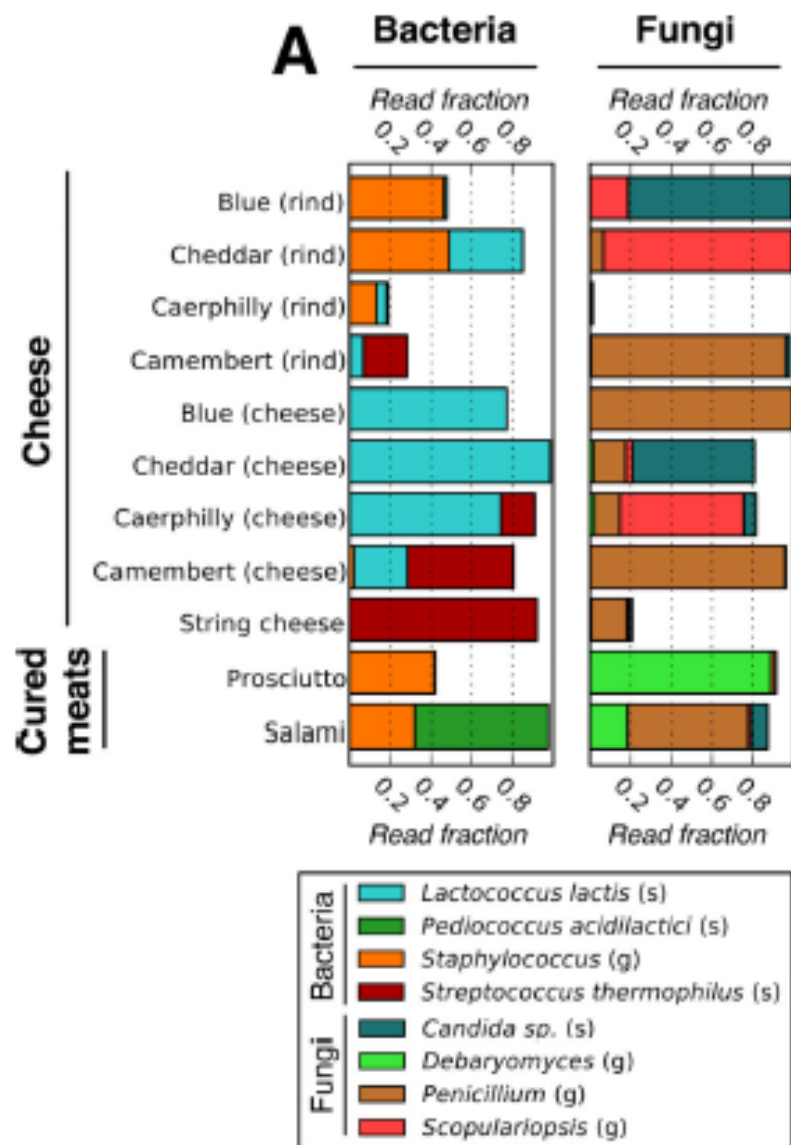
- Recurrent C. diff infection (RCDI) characterized by repeated episodes of diarrhea, abdominal pain and sometimes sepsis affects 20%-40% of patients with CD
- **Cause:** disruption of intestinal microbiota by antibiotic exposure, age, medical conditions and suboptimal immune response.
- Standard treatment for RCDI is a taper regimen of oral vancomycin over 6-8 weeks—but this approach may actually exacerbate the infection.
- FMT has been used for several years for the treatment of recurrent C. difficile infection (CDI).
- FMT has proven to be efficient in 5 randomized control trials.
- FMT is 85%-90% effective for the treatment of CDI.



Nutritional Therapy: Diet Interventions

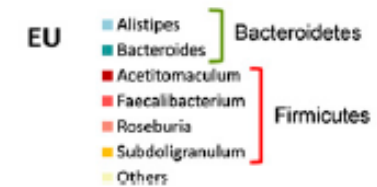
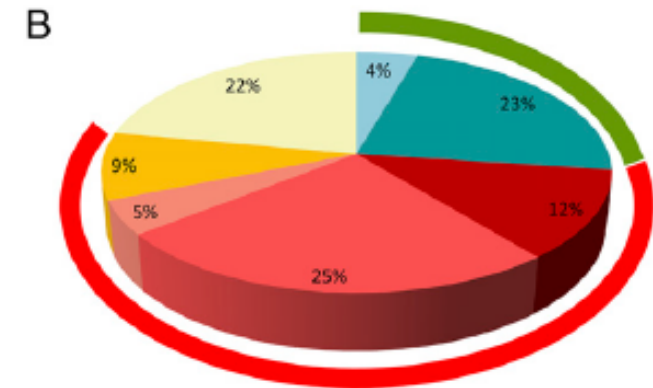
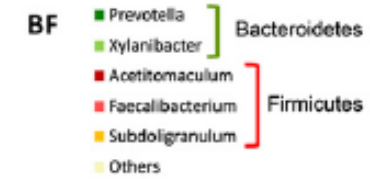
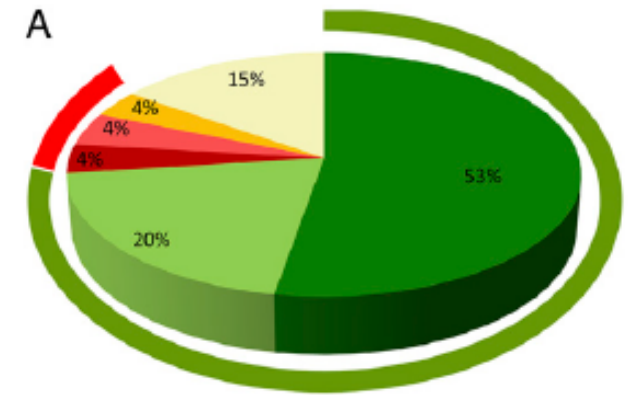
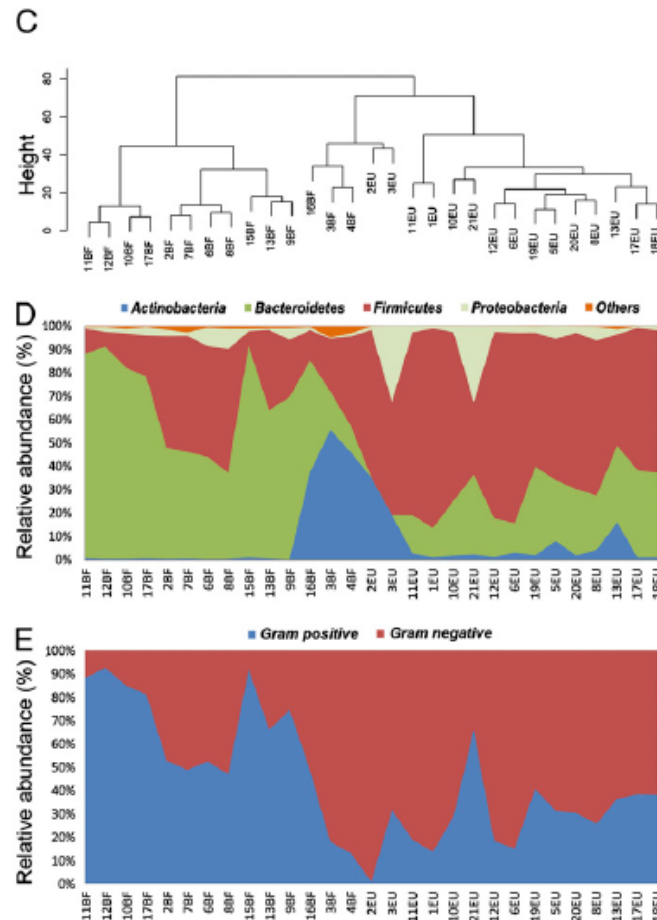
- 10 healthy Americans: 6 males; 4 females
- Sequentially placed on Plant-based and Animal-based diets for 5 days
- Plant-based diet:
 - Increased fiber
 - Decreased fat, protein
 - Change in beta-diversity





Microbiome & Diet Study:

- Study of breastfed children from Africa (Burkina Faso) and Italy



**Learning Objective 2:
Recognize how exercise can improve
function in MS**

Why is Exercise/Physical Activity Important for Someone with MS?

- Surgeon Generals 1996 Report
- People with disabilities (chronic disease) less likely to engage in regular, moderate physical activity, yet have similar needs to promote health and prevent unnecessary disease.

What About Exercise and MS?

Historical Thoughts

- Bad for MS
- Sedentary and stress-free

Contemporary Evidence

- Safe and effective
- Not all stress is bad

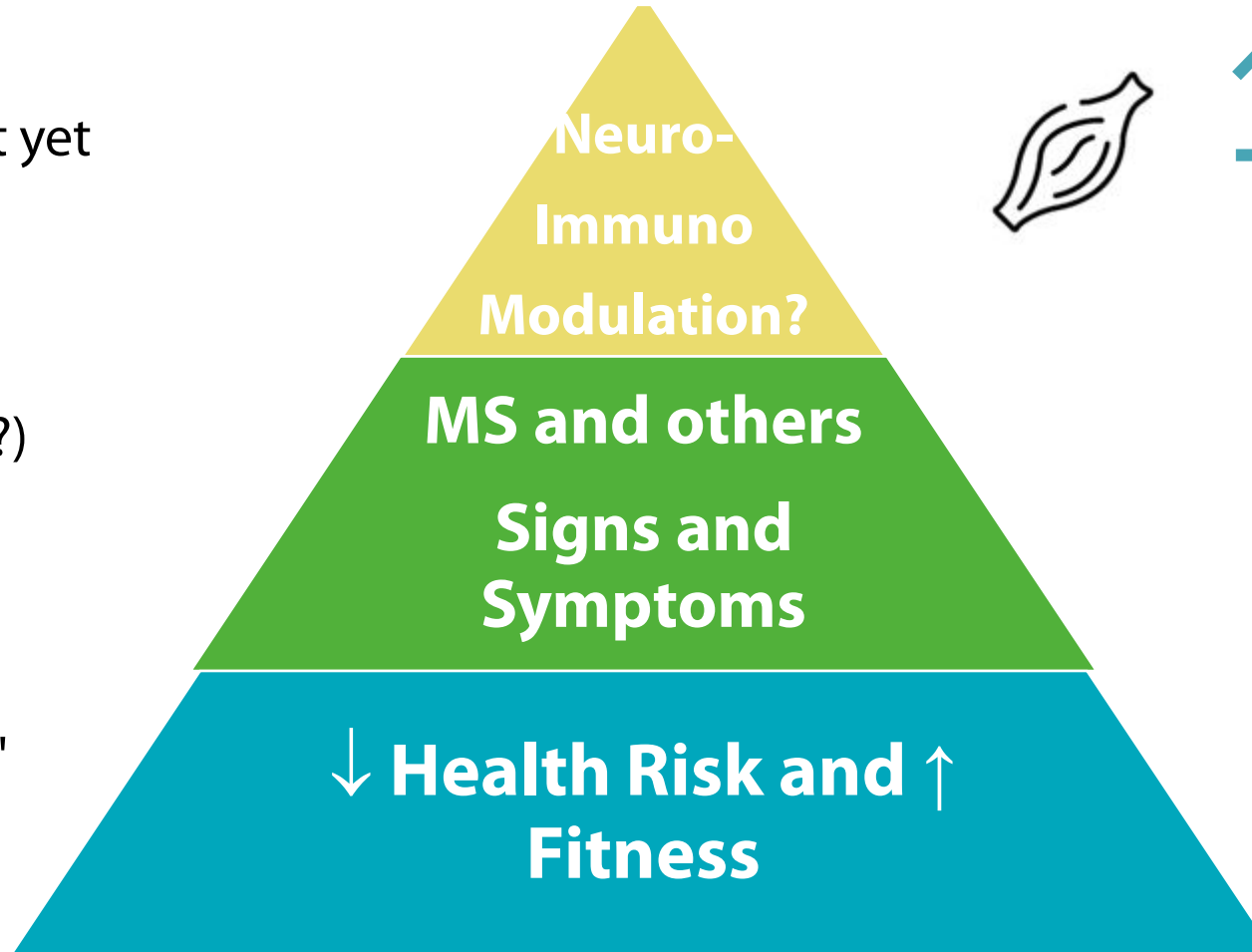


Exercise and MS: What We Think We Know

“Some that have not yet
come to pass”

“Things that are” (?)

“Things that were”



• BDNF

• BDNF
• IL-6

• Gait
• Bone
• Fatigue
• Depression /Mood

• Cardiovascular disease
• Cancer; colon, breast
• **Obesity, Type II Diabetes**
• All Cause

What are the exercise recommendations?

- **Encourage** ≥ 150 min per week of exercise and/or ≥ 150 min per week of lifestyle physical activity. Can mix and match.
- Greater than “current” but same recommendations as for the public.

... and what's new?



Components of an Exercise Program

- Cardiopulmonary Endurance
 - cardio, aerobic
- Strength/Endurance
- Balance/Coordination
- Flexibility



shutterstock.com • 114351703

Exercise Guidelines



FITT Principle

- *Frequency*
 - How often should you exercise?
- *Intensity*
 - How hard should you exercise?
- *Time/Duration*
 - How long should you exercise?
- *Type/Specificity*
 - What type of exercise is most appropriate?

Must be Individualized

- *Goals*
 - Health, QOL, Hanging with friends, SKI for MS, MS 150, MS triathlon
- *Risks*
 - Falls, Fatigue, Pain
- *Experience and starting level*
 - Couch potato or marathon runner?
 - Ability/Disability level

Aerobic or Cardio Exercise Recommendations (Sample from Existing Guidelines)

- **Frequency?**
 - 2-3x week
- **Intensity?**
 - Work up to Moderate ↑
 - RPE : 11-13 (20 pt scale), 2-6 (10 pt scale);
- **Time/ Duration?**
 - 10-30 min
- **Type or Mode**
 - **Mild:** walk, run, cycle, hike, pole walking, swimming, etc.
 - **Moderate:** *same or adaptive* e.g. 3-wheel cycle, pole walking, recumbent cycling, hand cycle, seated aerobics, aquatic aerobics
 - May need guidance of exercise professional
 - **Severe (expert opinion):** walker or wheel chair, breathing exercise, hand-crank, breathing, adaptive, guidance of exercise professional to adjust FITT



Exercise Intensity RPE

Ratings Perceived Exertion (RPE)

- 2-6 10 pt scale
- 11-13 20 pt scale

0	— Nothing
1	— Very, Very Light
2	— Light
3	— Moderate
4	— Somewhat Hard
5	— Hard
6	
7	— Very Hard
8	
9	— Very, Very Hard
10	— Maximal

6	No exertion
7	
8	
9	
10	
11	Light
12	
13	Somewhat hard
14	
15	Hard (heavy)
16	
17	Very hard
18	
19	
20	Maximal exertion

Common *Misconceptions* (For All)

- **Must be vigorous?**
 - Recommendations are for moderate
 - But vigorous is ok and can be beneficial!
 - HIIT, high intensity interval
- **Light activities counts?**
 - No...must be at least moderate (exercise)
 - Brisk walking, gardening, kayaking (flat H₂O)
 - But...yes for health and physical activity
- **Must it be continuous?**
 - No... its the cumulative time that's important



Strength or Resistance Exercise Recommendations

- **Frequency**
 - 2 sessions week
- **Intensity**
 - 2 sets, 8-15
 - Start slow work up
- **Time/Durations**
 - 1 session or multiple smaller
- **Type/Mode**
 - Free wghts, machines, bands
 - Body resistance, soup cans, milk cartons
 - Assistive with rehab, breathing, standing, e-stim



Marquette University
Strength and Conditioning Laboratory

Neuromotor

For:

- Balance
- Coordination
- Gait
- Flexibility

Frequency

- 3-6x/week

Time/Duration

- 20-60 min

Type/Mode

- Mild/Moderate: yoga, tai-chi, Pilates, dance, hippotherapy etc.
- Severe (expert opinion): as appropriate with help from exercise/rehab professional

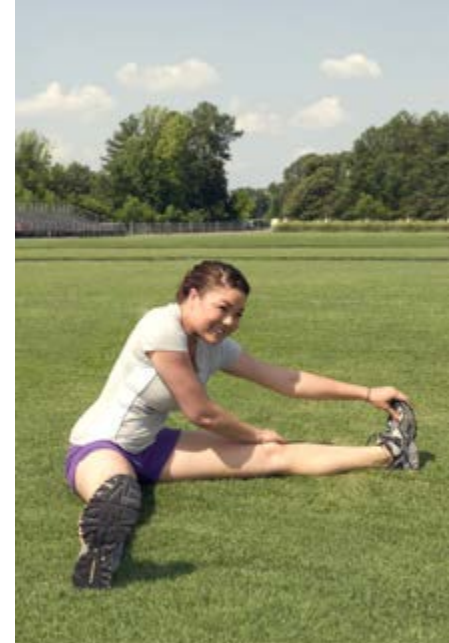


Bob Stockfield

Courtesy: National Center for Complementary and Alternative Medicine

Flexibility

- Flexibility activities help manage spasticity
- Frequency
 - 2-7 x week
- Intensity
 - 2-3 repetitions
- Time/Duration
 - Hold each repetition 20-60 seconds
- Type/Mode
 - Individually, with partner, or with equipment, yoga
 - 1x /day adaptaton/assistance as necessary, rehab



CDC/ Amanda Mills

Meeting Guidelines Can:

- Improve fitness
- Reduce fatigue
- Improve mobility
- Enhance quality of life



Yikes! 150 Minutes a week?

From the ACSM 2011 Guidelines and U.S. Dept of HHS:

“For all individuals, some activity is better than none.”

“Adults who are unable or unwilling to meet the exercise targets outlined here still can benefit from engaging in amounts of exercise *less than* recommended.”

And...Physical Activity Counts!

Increase Lifestyle Physical Activity to ≥ 150 min

Mild/Moderate: walk/stroll/hike with poles, cycle, swim, play with dog or grandkid, sports, Wii Fit (or other) seated or standing, dance, box. Get a puppy!

Severe: manual wheelchair propulsion, swim, aquatics, adaptive sports, seated yoga or dance, be as active as possible



CDC/Amanda Mills



What Else Should We Expect?

Barriers

- Lack of time
- Access
- Fear of falling
- No support
- Fatigue
- Self conscious
- Transportation
- Knowledge

Barrier Busters!

- Mobility Aids
- 2 Hour Rule
- Consider Time of Day
- It's OK to Miss a Day (or 2)
- Friends
- Fatigue
 - Good and bad days
 - Cooling strategies
 - Pre, During, Post

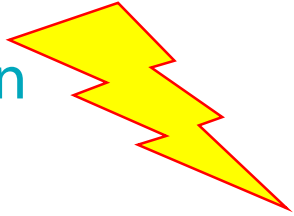
How to help start or maintain an active lifestyle with MS?

- Physical Activity and Exercise are **important**
- Physical Activity and Exercise are **achievable**
- Everything is **relative**
- Bottom line – If it works for you, it works!
 - **Try something new!**
Climbing, skiing,
biking, canoeing, dancing!



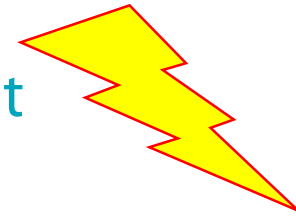
Diet and Exercise: Two Sides of the Same Equation

NRG in



Diet

NRG out



Metabolism

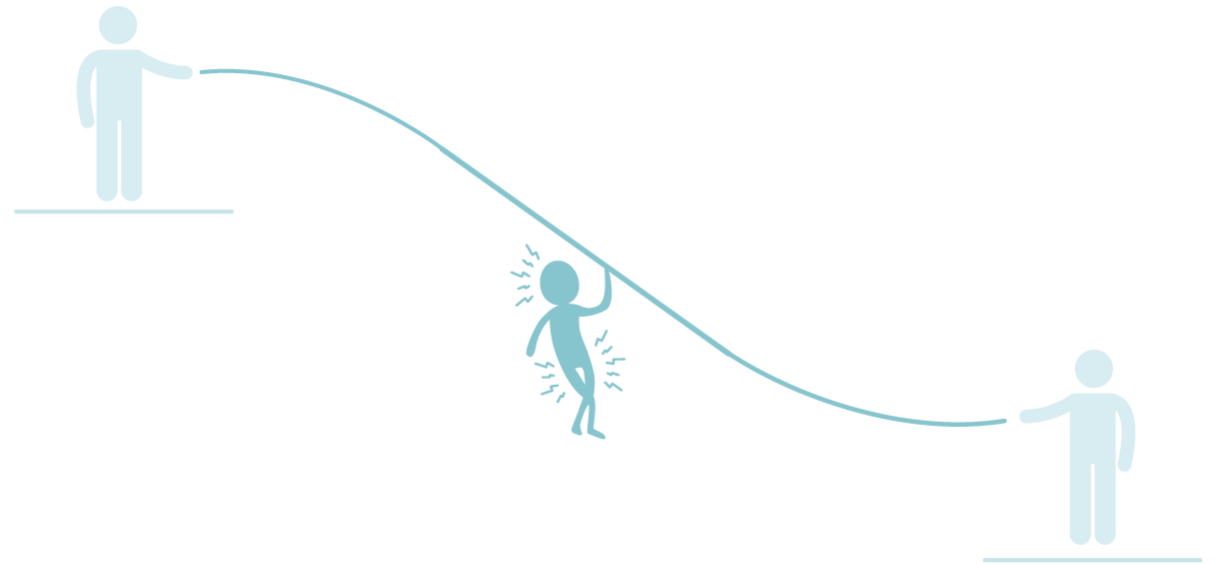
Health
Wellness

Learning Objective 3:
Use current recommendations to start forming personal goals for diet & exercise

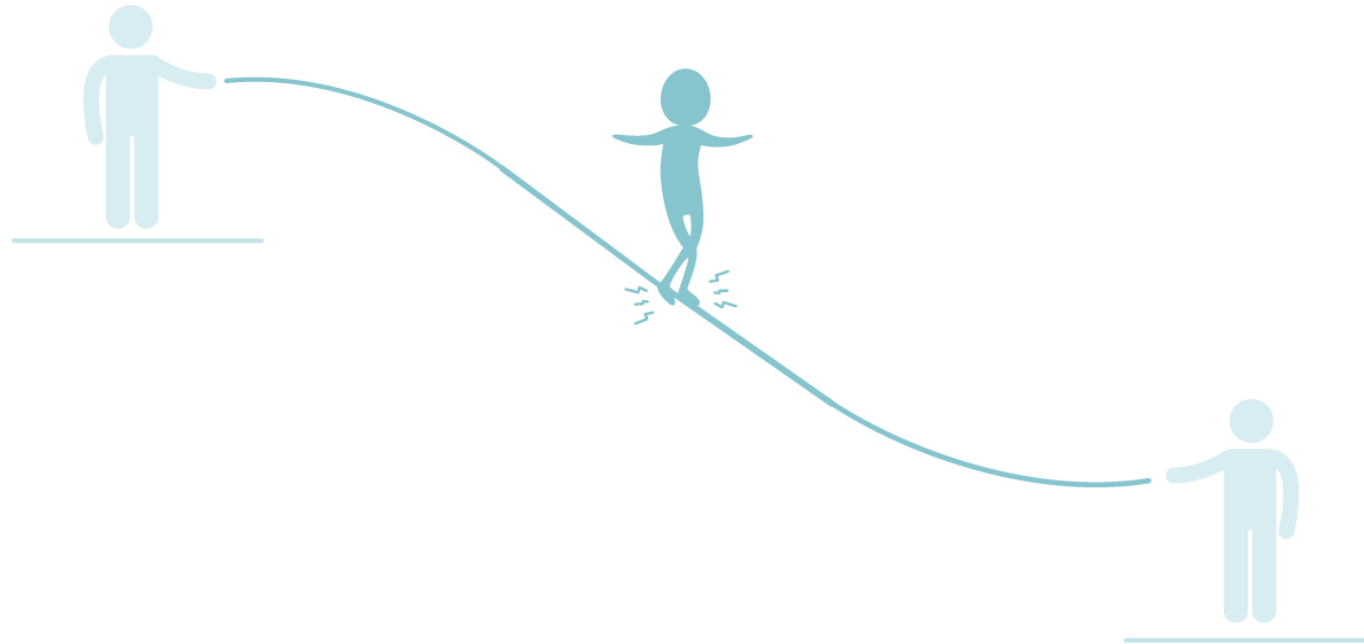
Holly and the MS Tightrope:

Holly is 40 and lives with MS. During quarantine Holly has picked up the following behaviors:

- Smoking
- Eating poorly: lots of processed foods
- No exercising: swimming pool closed and stuck inside
- Weight gain
- Fatigue
- Poor sleeping patterns



How to Get Holly Back on Top:



Q & A



JANUARY PROGRAMS

JUMPSTART – Jan 9

Understanding Exercise and Diet

COACHING - Jan 13

Your Winter Workout Motivation

JUMPSTART – Jan 21

Creating Diet Plans that Stick

COACHING - Jan 26

Fuel Up, Feel Food, and Break the Emotional Eating Cycle



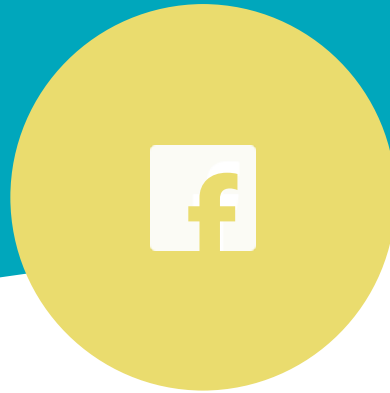


Connect With Us



Twitter

@CanDoMS



Facebook

@CanDoMultipleSclerosis



Instagram

@CanDoMultipleSclerosis





ANGELA
MS NAVIGATOR

Connect
When and Where You
Need Us

The National MS Society exists because there are people with MS. **Our vision is a world free of MS.** Everything we do is focused so that people affected by MS can live their best lives as we stop MS in its tracks, restore what has been lost and end MS forever.





WEBINAR WEDNESDAY

THE BENEFITS OF SOCIAL ACTIVITY
AND CONNECTION

Wednesday, February 3 at 8pm ET

PRESENTED BY:

SANOFI GENZYME 

 Bristol Myers Squibb™

Genentech
A Member of the Roche Group

Janssen 
PHARMACEUTICAL COMPANIES
OF Johnson & Johnson

EMD Serono

The preceding program is copyrighted by Can Do Multiple Sclerosis. It is provided for your personal educational and referential use only. Any repurposing or dissemination of its content requires the consent by Can Do Multiple Sclerosis.

© Can Do Multiple Sclerosis