

# Nutrition and other integrative approaches in MPN



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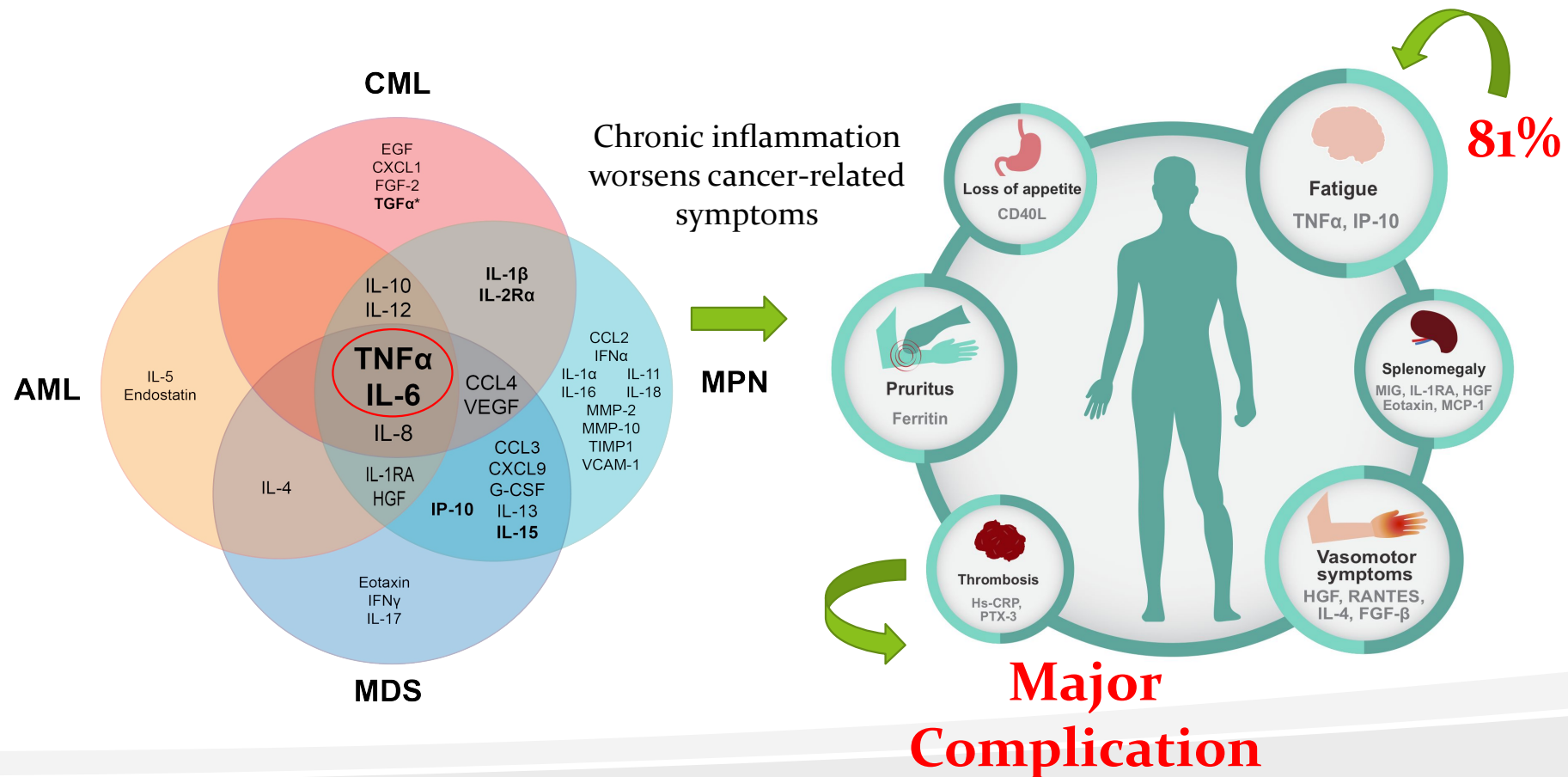
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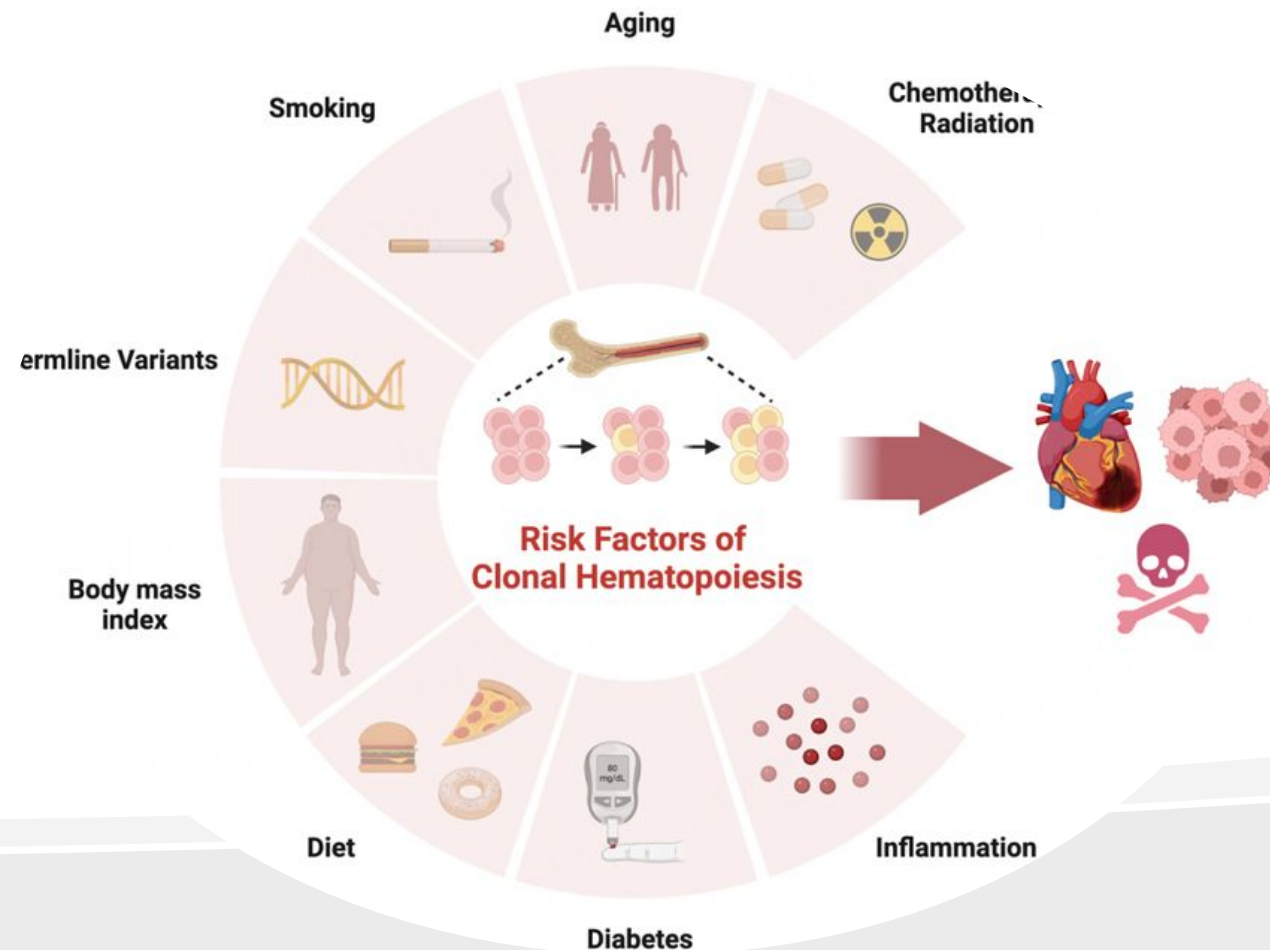
MPN is a chronic inflammatory condition



# Inflammation's impact in MPN

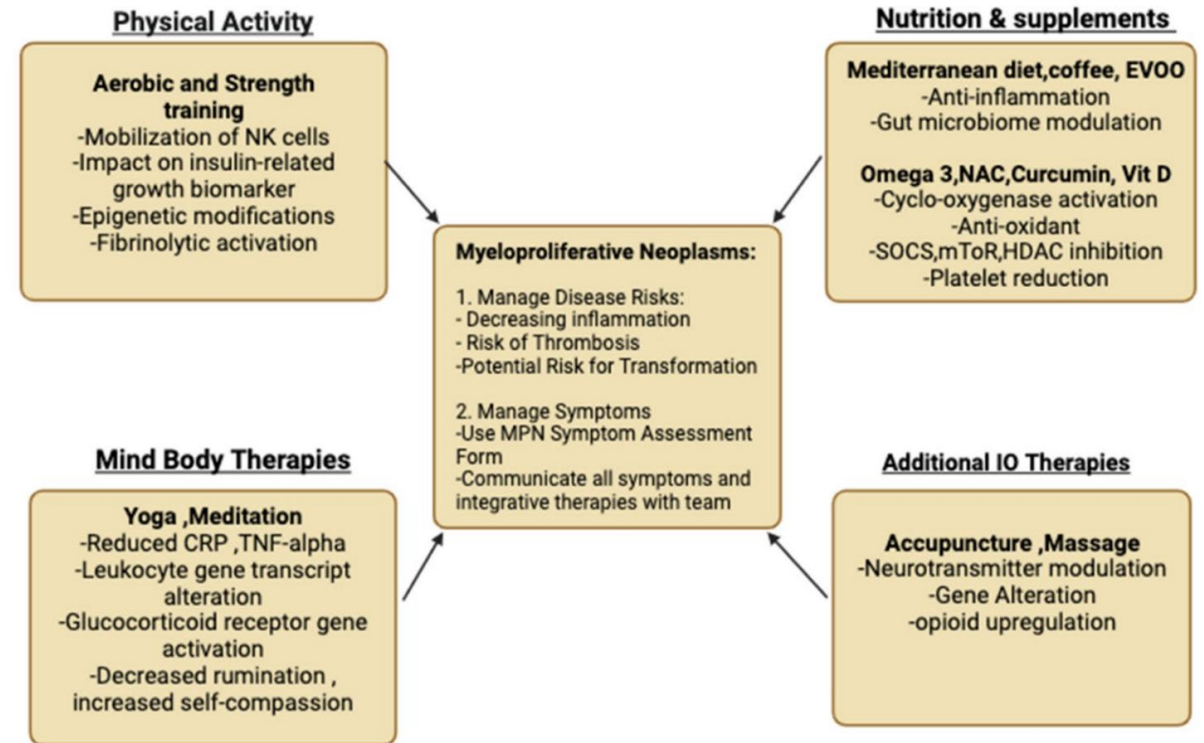
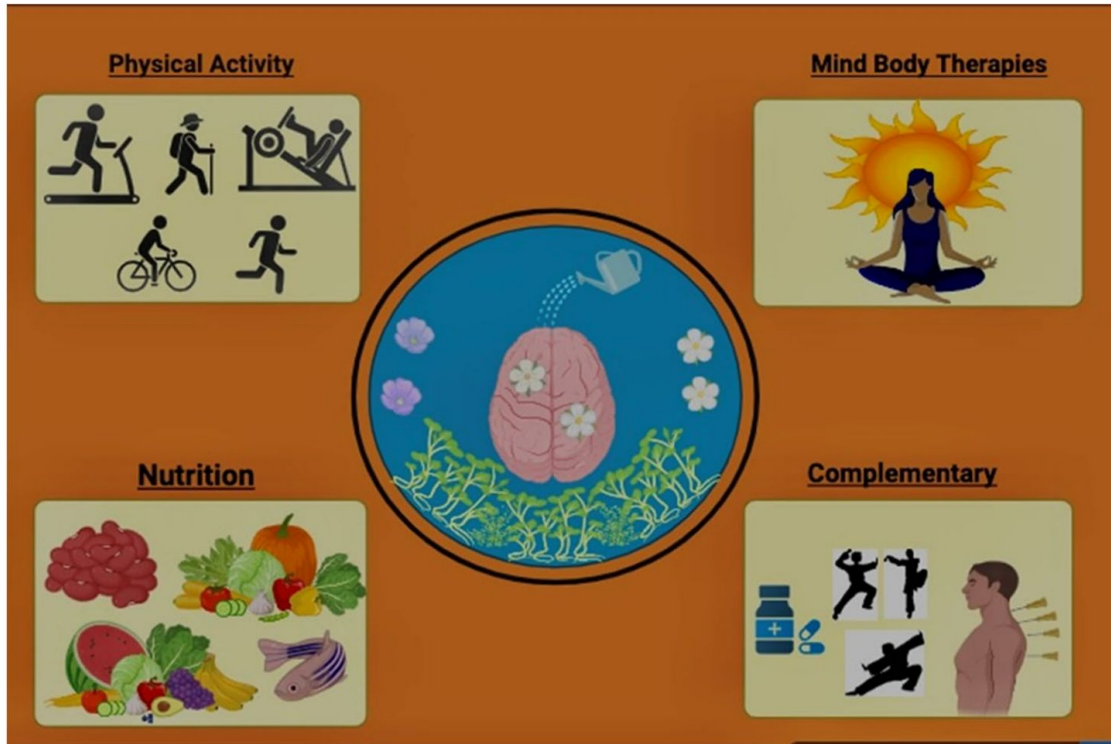


# Lifestyle choices impact incidence of outgrowth of mutant blood cells (aka CHIP)





# A multi-modal approach to managing your health with MPN



# Recommended Reading:

Current Oncology Reports (2024) 26:1135–1145  
<https://doi.org/10.1007/s11912-024-01568-9>

REVIEW



## Optimizing Care: Integrative Oncology in Myeloproliferative Neoplasm

Shagun Singh<sup>1</sup> · Supriya Peshin<sup>2</sup> · Ashley Larsen<sup>3</sup> · Krisstina Gowin<sup>4</sup>

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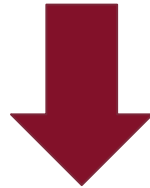


# Studies using yoga in MPN

Study design	Reference	# patients	Key Findings
60 min/wk of online, home-based yoga	Huberty et al, Integr Cancer Ther. 2018	39	Improved pain, anxiety, depression and sleep
Survey	Gowin et al, Blood 2018	858	Those practicing yoga had lower depression
12 week yoga intervention	Huberty et al, Haematologica 2017	38	Improved NIH PROMIS quality of life
Yoga intervention	Eckert et al, Blood 2017	48	Reduced plasma TNF levels



- Low risk
- Low cost
- Reduce inflammation





# Using diet to manage MPN

Using “medicinal” properties of foods



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Using “medicinal” properties of foods



Nutrition as way to optimize health





# Anti-inflammatory diet: Mediterranean Diet

- The Mediterranean diet has proven to be beneficial in metabolic diseases, which are characterized by chronic subclinical inflammation.

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## Primary Prevention of Cardiovascular Disease with a Mediterranean Diet

Ramón Estruch, M.D., Ph.D., Emilio Ros, M.D., Ph.D., Jordi Salas-Salvadó, M.D., Ph.D.,  
María-Isabel Covas, D.Pharm., Ph.D., Dolores Corella, D.Pharm., Ph.D., Fernando Arós, M.D., Ph.D.,  
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José Lapetra, M.D., Ph.D., Rosa María Lamuela-Raventós, D.Pharm., Ph.D., Lluís Serra-Majem, M.D., Ph.D.,  
Xavier Pintó, M.D., Ph.D., Josep Basora, M.D., Ph.D., Miguel Angel Muñoz, M.D., Ph.D., José V. Sorlí, M.D., Ph.D.,  
José Alfredo Martínez, D.Pharm, M.D., Ph.D., and Miguel Angel Martínez-González, M.D., Ph.D.,  
for the PREDIMED Study Investigators\*

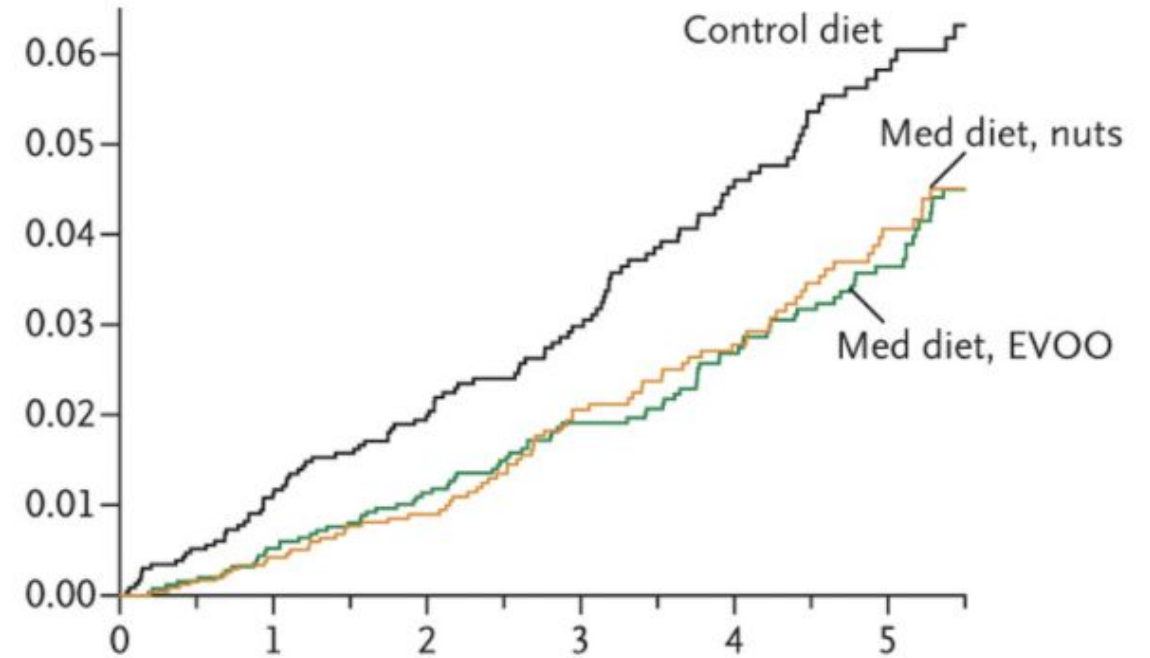


# Mediterranean Diet Reduced Cardiovascular Events

- PREDIMED Trial (Prevención con Dieta Mediterránea)



death from cardiovascular causes)





# Mediterranean Diet - What is it?



## A food pattern shared by countries around the Mediterranean Sea

- No specific rules or restrictions
- Focus on whole, plant foods and healthy fats
- Can use foods from many cultures (not just those around the Mediterranean)







# Can Diet Impact MPN?





# Dietary Intervention Studies in MPN we've performed so far

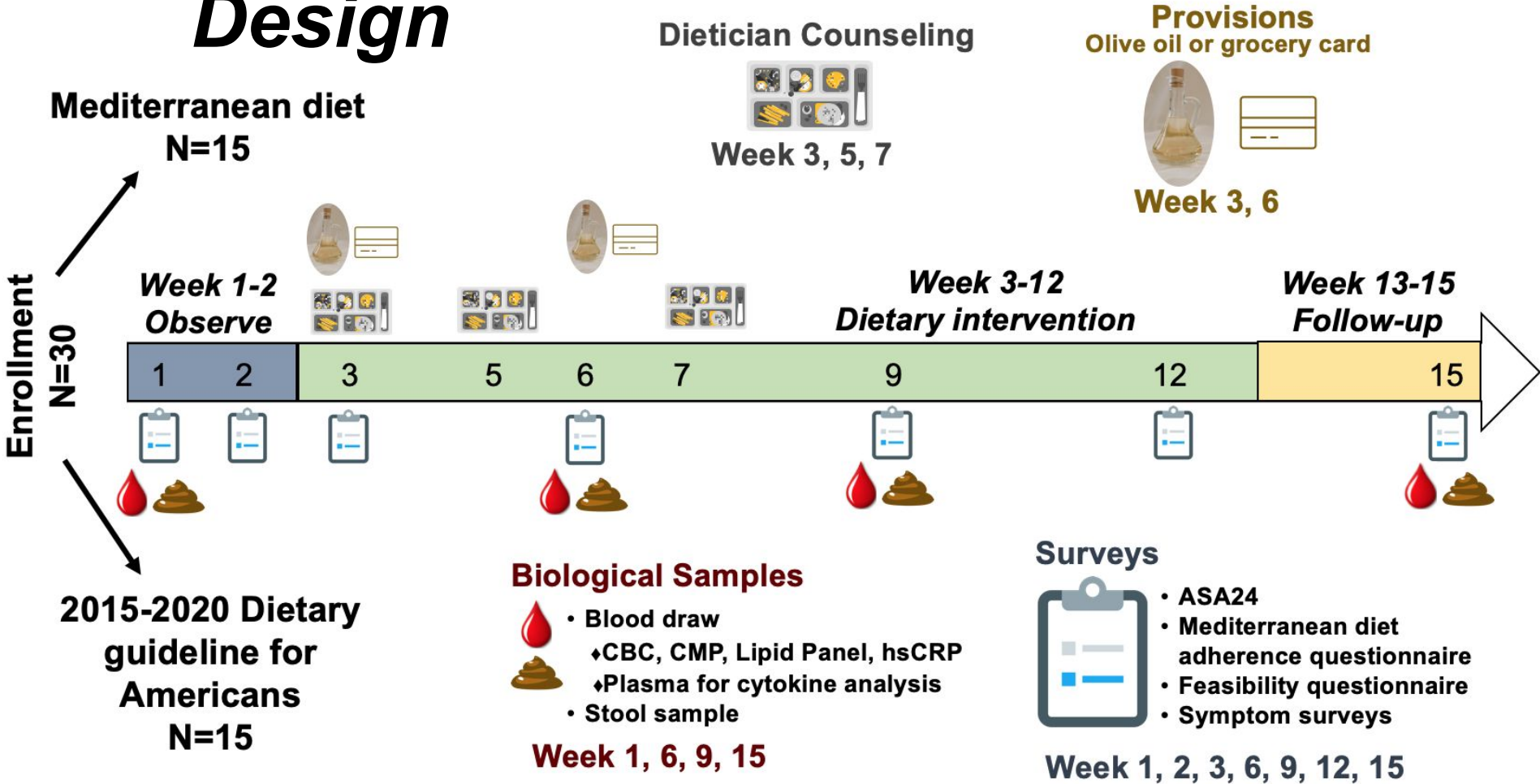
## Initial Pilot Study

- MED vs USDA diet
- 28 participants
- In person dietitian counseling, weekly curriculum sent via email
- CBC, CMP, hsCRP, plasma cytokines, gut microbiome

## E-intervention

- MED vs DASH diet
- 28 participants
- Zoom dietitian counseling, written curriculum

# Initial Pilot Study Design



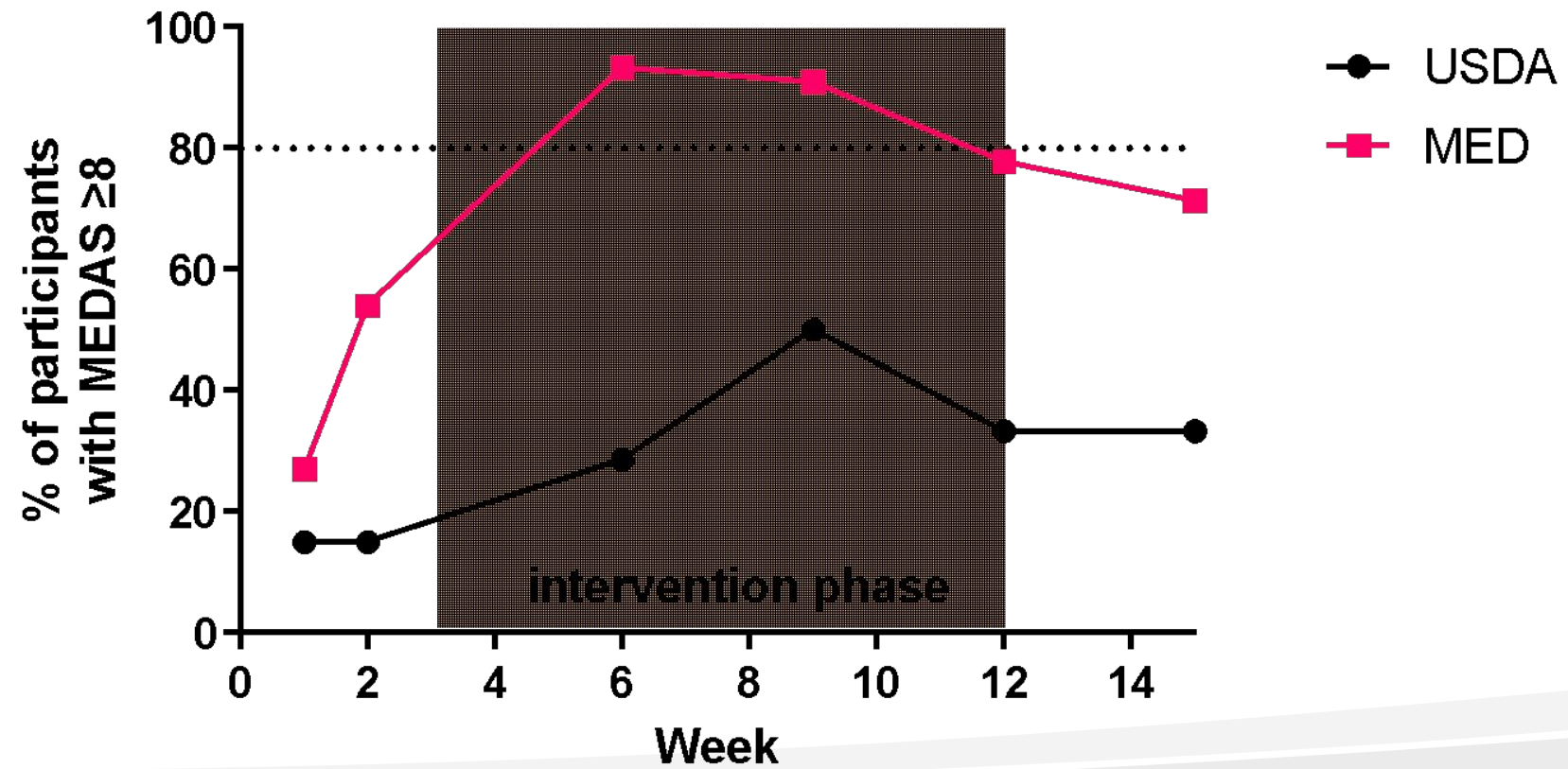


# Main point of study



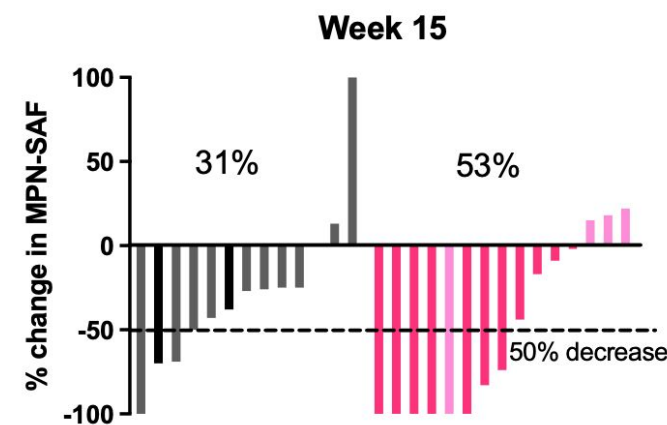
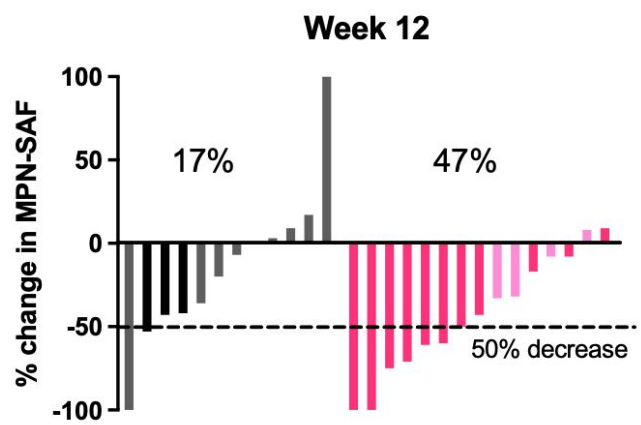
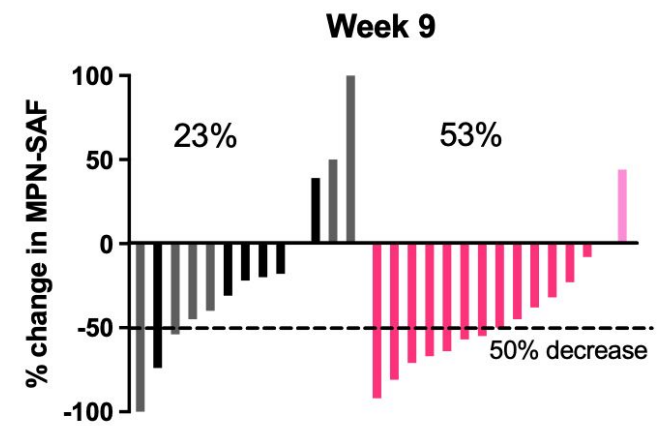
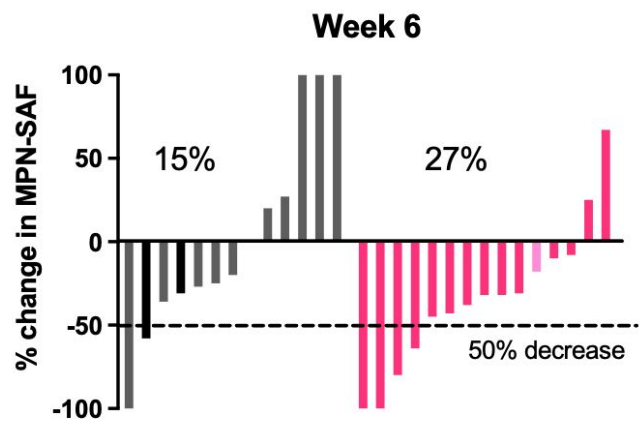
Can MPN patients change their diet with dietician counseling and curriculum?

# MPN patients can adopt a Mediterranean Diet





# Impact of diet on MPN symptoms



■ USDA  
■ MED

Lighter shade = Med Adh. Score <8  
Darker shade = Med Adh. Score ≥8





# Other things we measured in the study

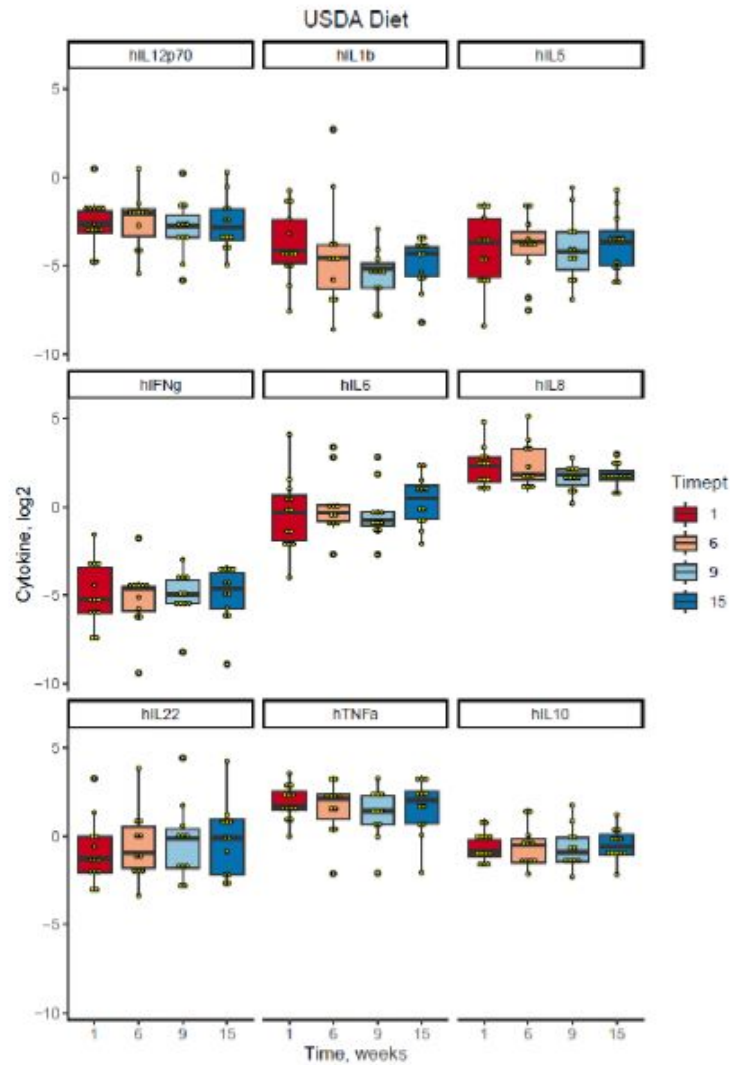
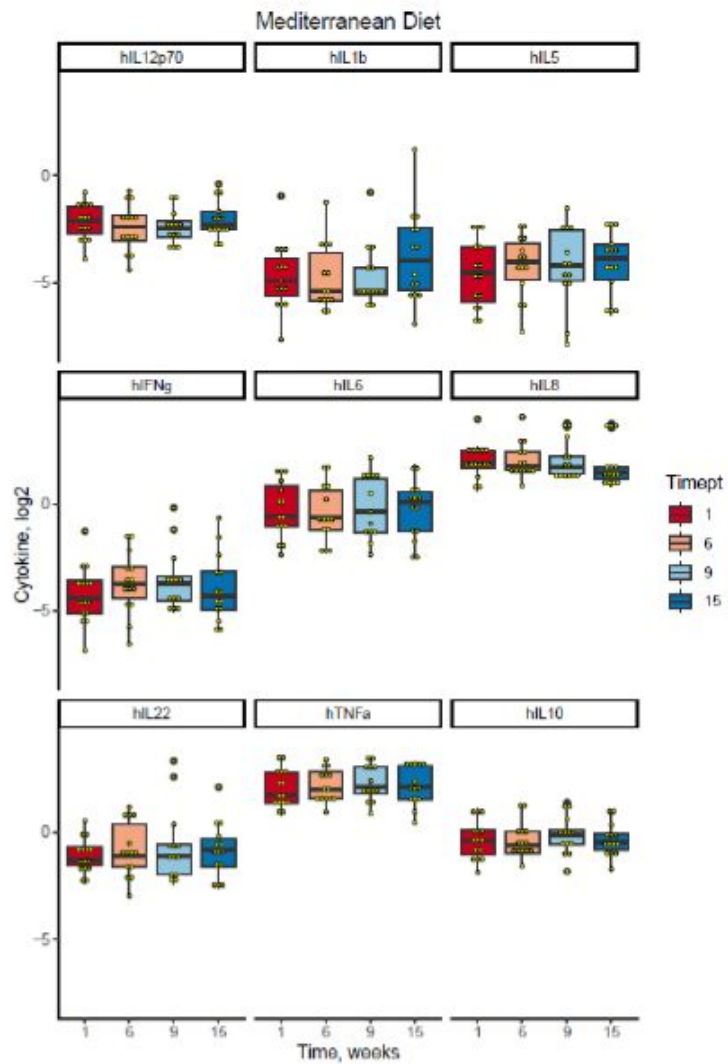
Blood counts

Cholesterol

hsCRP

Inflammatory proteins in the blood

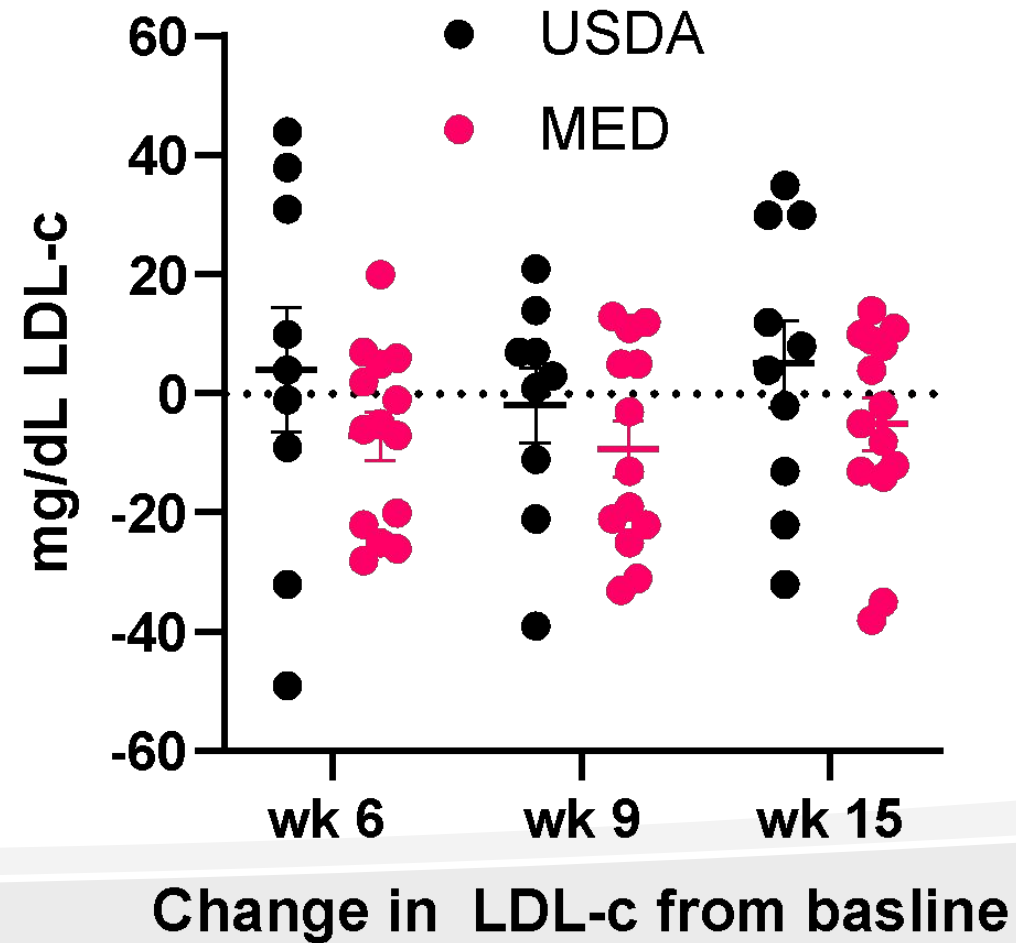
Gut microbiome



Impact of diet on inflammatory cytokines



# Impact of diet on LDL cholesterol









## Next steps:

- What diet is best? Do MPN patients need a more aggressive dietary approach than the general population to reduce their cardiovascular risk?

# Portfolio Diet

## WHAT DOES THE PORTFOLIO DIET LOOK LIKE?

Expected LDL-Cholesterol lowering:

1	<b>NUTS 45g DAILY</b> All nuts are good for your heart and cholesterol and contrary to concerns do not contribute to weight gain. Add nuts as a snack between meals, adding to salads, cereals, or yogurt. Trying nut butter on your toast is an option. 45g is about a handful of nuts. If allergic to peanuts or tree nuts, try seeds.		5 - 10%
2	<b>PLANT PROTEIN 50g DAILY</b> This is the most challenging component of the Portfolio diet. Start by trying to get 25g daily. Consider replacing milk with soy milk, try tofu, soy nuts and beans.		5 - 10%
3	<b>VISCOUS (STICKY) FIBRE</b> Aim to eat 2 servings of oatmeal, beans, lentils, and chickpeas a day. Replace bread with rye or pumpernickel or oatcakes. Eat at least 5 servings of fruit and vegetables every day. Aim to eat 2 servings per day of oatmeal, barley, or cereals enriched with psyllium or oat bran. Replace white bread with whole grain oat breads. Put oat bran or psyllium into smoothies. Eat at least 5 servings per day of vegetables (eggplant, okra) and fruit (apples, oranges, berries) high in viscous fibre.		5 - 10%
4	<b>PLANT STEROLS 2g DAILY</b> These occur naturally (soybean, corn, squash, etc.) but to get this amount of sterol you will require fortified foods such as spreads, juices, yogurt, milk and even supplements as part of a meal.		5 - 10%

TOTAL: ~30%

Statins, the most effective class of

# Next Steps



MPN patients  
(n = 80)

- ET/PV/low, Int-1 MF
- LDL-c 100-160

2 weeks

**Observation**

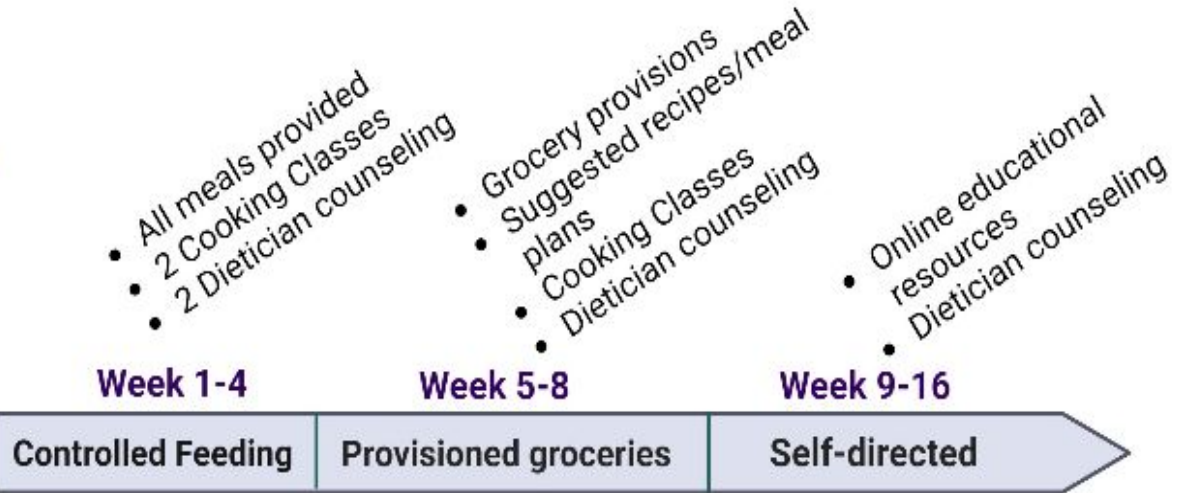
**Establish baseline**  
Eating pattern  
Lipids  
Inflammation  
Symptoms



**Portfolio Vegan**

Randomized 1:1  
Stratified by:  
*Sex*  
*LDL-c*  
*JAK2 mutation*

**Portfolio with lean animal proteins**



## Primary Endpoint:

Reduction of LDL-c at week 4 vs baseline

## Key Secondary Endpoints:

Reduction of LDL-c at week 8  
Reduction in symptom burden  
Durability of eating changes

## Biological Correlates:

Inflammatory cytokines  
Macrophage activation/foam cell development  
Gut microbiome/metabolites





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