



# Neuro Café: Diet and Neurological conditions

5<sup>th</sup> July 2023



# Diet and neurological function

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- Neurology and diet are integrally linked, so choosing the right diet is extremely important for enhancing your brain and heart health.
- Animal studies show that consumption of a Western diet, high in saturated fat, refined sugar, and processed foods, impairs learning and memory and is associated with:
  - oxidative stress
  - inflammation
  - mitochondrial dysfunction



# Brain fuel

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- Food is your body's fuel and medicine, so choose wisely
- The foods we eat play a critical role in regulating everything in our bodies.
- The brain uses it as fuel to carry out all of your regular tasks.
- What you eat and drink on a regular basis— has a much greater impact than eating more of one single food,





# Balanced diet – key for all neurological conditions

A balanced diet consists of brain food i.e. **food which is good for nerves and muscles.**

- eat a varied diet
- eat healthy portions of foods
- eat the right balance of food groups
- eat regular meals
- drink plenty of fluid (at least 6-8 glasses of water a day)
- eat at least five portions of fruit and vegetables a day
- [The Eatwell Guide](#) shows that to have a healthy, balanced diet



# Boost BRAIN Function!



Healthy eating for overall brain health

# Vegetables

- Choose non-starchy, organic vegetables dark in pigmentation, which indicates higher nutrient density:
  - Artichokes
  - Cilantro
  - Brussels sprouts
  - Broccoli
  - Kale
  - Onions
  - Ginger
  - Leafy greens
  - Chard
  - Mushrooms.





# Fruits

- Pick whole fruits with a low glycaemic index (low sugar):
  - Blueberries
  - Raspberries
  - blackberries
  - Strawberries
  - Lemons
  - Limes
  - Green bananas.
- Avoid juices and tropical fruit

## -----What are the----- HEALTHIEST FRUITS?

### AVOCADO

Sugar: 1g  
Total Carbs: 12g  
Fiber: 10g  
Net Carbs: 2g



### BLACKBERRIES

Sugar: 7g  
Total Carbs: 14g  
Fiber: 8g  
Net Carbs: 6g



### RASPBERRIES

Sugar: 5g  
Total Carbs: 15g  
Fiber: 8g  
Net Carbs: 7g



### STRAWBERRIES

Sugar: 7g  
Total Carbs: 11g  
Fiber: 3g  
Net Carbs: 8g



### WATERMELON

Sugar: 9g  
Total Carbs: 11.5g  
Fiber: 0.5g  
Net Carbs: 11g



### APPLES

Sugar: 11g  
Total Carbs: 15g  
Fiber: 4g  
Net Carbs: 11g



### PLUMS

Sugar: 16g  
Total Carbs: 19g  
Fiber: 3g  
Net Carbs: 16g



### ORANGES

Sugar: 17g  
Total Carbs: 21g  
Fiber: 4g  
Net Carbs: 17g



### BLUEBERRIES

### KIWI





# Healthy fats

- Incorporating healthy fats into a balanced diet can provide excellent fuel for the brain.
- Examples include
  - macadamia nuts
  - olive oil
  - coconut oil
  - Avocados
  - Chia seeds
  - MCT oils (medium chain triglyceride).





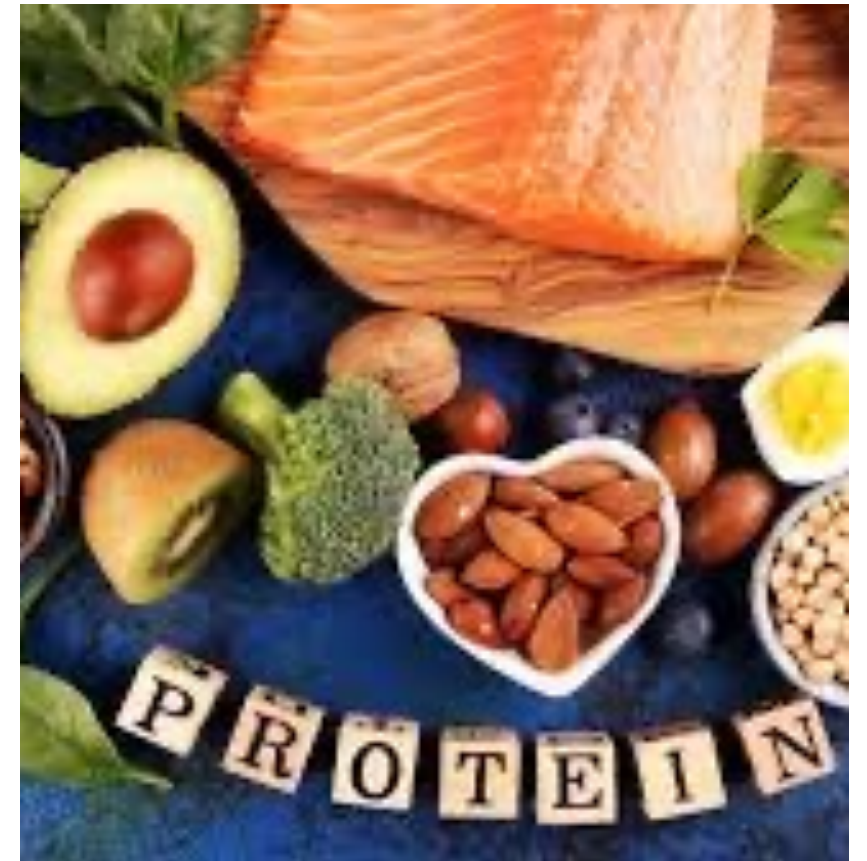
# GOOD FATS VS BAD FATS



# Proteins

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- Protein essential for healthy diet
- Most adults need around 0.75g of protein per kilo of body weight per day
- Select high-quality protein sources from grass-fed, organic, free-range, non-genetically modified sources where possible
- Eggs and fish are also good sources of protein, and contain many vitamins and minerals.
- Oily fish is particularly rich in omega-3 fatty acids.
- Emphasis on increasing your plant based proteins and decreasing animal protein:
  - Pulses, beans, peas and lentils, are naturally very low in fat and high in fibre, protein, vitamins and minerals
- Nuts, grains & seeds- good source of protein but can be high in calories so watch portion size





# Protein without the meat

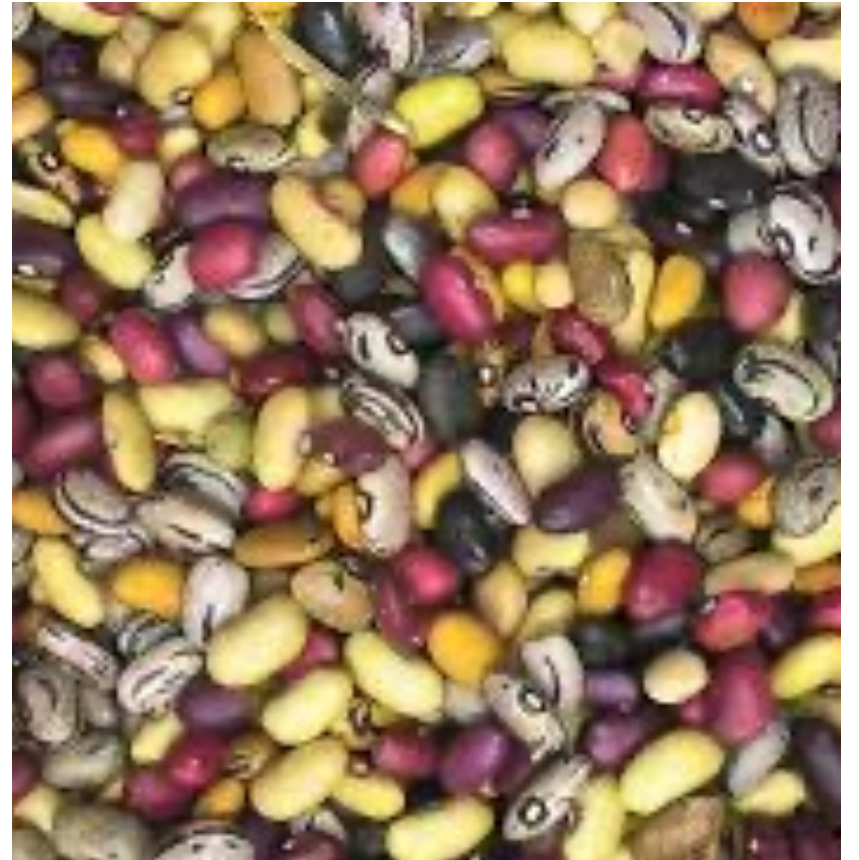
- Pulses
- Soya
- Quinoa
- Nuts
- Seeds
- Cereals and grains
- Quorn
- Dairy
- Eggs
- Fish



# Protein and Parkinson's

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- In some people, protein may interfere with the effects of their levodopa medication. Therefore it is generally advised that you should take your Parkinson's medication at least 30 to 90 minutes before meals.
- You may want to reduce the amount of protein you eat earlier in the day. This may help to increase the response your body has to the medication and avoid unpredictable motor fluctuations
- Protein re-distribution - eating your main protein meal in the evening may be preferential as a slower response to medication may not be as important as at other times of the day.
- If you do wish to review the timing of your protein intake, you should talk to your GP, specialist or Parkinson's nurse, or ask to see a registered dietitian.
- You should not stop eating protein altogether as it is vital to help your body renew itself and fight infection. Reducing protein may cause dangerous weight loss.



# Fish & seafood

- **A healthy, balanced diet should include at least 2 portions of fish a week, including 1 portion of oily fish.**
- Oily fish such as are herring, mackerel and salmon:
  - high in long-chain omega-3 fatty acids, which play an essential role in brain and heart health. Omega-3s have been shown to [decrease inflammation](#) and [reduce the risk of heart disease](#).
  - a good source of [vitamin D](#)
- Be mindful of avoiding fish that is high in mercury and other contaminants
- Follow recommendations for women pregnant or trying to get pregnant
- Select “wild caught” fish over “farm raised ” when you can

Fish that is steamed, baked or grilled is a healthier choice than fried fish.

To ensure there are enough fish and shellfish to eat and prevent overfishing, choose from as wide a range of fish as possible







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## Specific diets

- Mediterranean
- DASH
- MIND
- Ketogenic
- Anti Neuro inflammatory diet





## What to Eat on the Mediterranean Diet!



Whole Grains, Legumes,  
Fruit, Vegetables, Healthy  
Fats, Herbs & Spices  
Enjoy Daily



Fish, Seafood & Omega-3  
Rich Food  
Enjoy 2-3x/week



Poultry, Eggs & Dairy  
Enjoy 1-2x/week



Red Meats & Sweets  
Enjoy Sparingly



Physical Activity,  
Meal & Family Time  
Practice Daily



## Mediterranean Diet Pyramid

Red meats & sweets  
Enjoy Sparingly



Poultry, eggs & dairy  
Enjoy 1-2x/wk



Fish, seafood &  
omega-3 rich foods  
Enjoy >3x/wk



Whole grains, legumes,  
fruit, vegetables, healthy  
fats, herbs & spices  
Enjoy Daily



Physical activity, meal  
& family time  
Practice Daily





# Dietary Approach to Stop Hypertension (DASH)

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- Proposed by the National Heart, Lung, and Blood Institute, the Dietary Approaches to Stop Hypertension (DASH)
- Diet emphasizes many of the components in the Mediterranean Diet in addition to a reduction in overall consumption of carbohydrates and sodium.
- It has been shown to reduce blood pressure and may be particularly beneficial for people with cardiovascular disease.



## DASH Diet

### Per Day:

- 4-5 servings of fruit
- 4-5 servings of vegetables
- 6-8 servings of whole grains
- 2-3 servings of low-fat or fat-free dairy per day
- 6 or less servings of meat, chicken, or fish
- 2-3 servings of heart-healthy fats and oils



## The DASH Food Pyramid



Choose salt-free or low-salt foods from all categories.  
†† servings tend to be partial - applies to all other categories

# THE DASH DIET

Ranked #1 Best Diet Overall by U.S. News & World Report

## Weight Loss Solution

2 WEEKS TO DROP POUNDS, BOOST METABOLISM, AND GET HEALTHY

Marla Heller, MS, RD  
New York Times Bestselling Author

## DASH DIET

- 4-5 servings per week of nuts, seeds, soybeans
- 6-8 servings per day of whole grains
- 4-5 servings per day of vegetables
- 4-5 servings per day of fruits
- 2-3 servings per day of fat-free or low-fat dairy
- 6 servings per day of lean meats, poultry, fish
- 5 servings per week of eggs
- 2-3 servings per week of fats and oils

Source: National Heart, Lung and Blood Institute





# THE MIND DIET



3 PORTIONS OF WHOLEGRAINS A DAY



1 DARK GREEN SALAD AND 1 OTHER VEGETABLE A DAY



BERRIES AT LEAST TWICE A WEEK



AT LEAST 30 GRAMS OF NUTS PER DAY



BEANS OR LEGUMES AT LEAST EVERY OTHER DAY



POULTRY AT LEAST TWICE A WEEK

FISH AT LEAST ONCE A WEEK



AT LEAST 140ML OF RED WINE EVERY DAY



NO MORE THAN 1 TBSP A DAY OF BUTTER OR MARGARINE  
CHOOSE OLIVE OIL INSTEAD



CHEESE, FRIED FOOD AND FAST FOOD NO MORE THAN ONCE A WEEK



PASTRIES AND SWEETS LESS THAN 5 TIMES A WEEK



# MIND DIET

EAT TO LOWER YOUR ALZHEIMER'S RISK



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## Ketogenic diet

- The ketogenic diet has been used for treatment of drug-resistant epilepsy for a number of decades and is also being studied for its therapeutic effect in other neurological disorders
- The ketogenic diet is high in fat and low in carbohydrates, typically at a ratio of 3–4:1.
- There is now considerable evidence that the diet results in seizure reduction in up  $\frac{3}{4}$  of drug-resistant epilepsy patients
- Some emerging evidence that ketogenic diet may have some neuroprotective effect in overall brain health





# A KETO DIET

## WHAT CAN I EAT



Pick a Protein	Pick one or two Low carb Veggies	Add Fat <small>(For those used to butter)</small>
<p><b>Meat</b> Ground beef, steak, beef or pork roast, pork chops, beef or pork ribs, lamb, chicken, turkey, duck</p> <p><b>Del meats*</b> Bacon, hotdogs, sausage, luncheon meats of all varieties, Spanish chorizo, patatas salami, pepperoni, salami, soppressata</p> <p><b>Canned meats</b> Tuna, salmon, chicken, ham, crab</p> <p><b>Organ meat</b> Liver, heart, brain, gizzards</p> <p><b>Fish</b> Salmon, trout, cod, tuna, and all other varieties</p> <p><b>Seafood</b> Scallops, shrimp, crab, mussels, lobster, prawns, oysters, squid</p> <p><b>Eggs</b></p> <p><b>Plant-based protein</b> Tofu, tempeh, nuts, mock soybeans</p>	<p>Asparagus Bok choy Broccoli Broccoli sprouts Cabbage Cauliflower Celery Cucumber Eggplant Fennel Green beans Eggs of all types Scams Lentils Lentils of all types Mushrooms Olives Onions Peppers Pumpkin Radishes Shallots Sneezewort Spinach Squash Sugar snap peas Tomatoes Turnips Zucchini</p>	<p><b>Nut oils</b> Coconut, olive, avocado, sesame, rapeseed, macadamia nut, walnut, almond</p> <p><b>Non-dairy fats</b> Lard, ghee, tallow, duck fat, schmaltz (chicken fat), rendered cream, coconut milk</p> <p><b>Dairy</b> Butter, cream, whole cream heavy cream, cream cheese, Greek yogurt, mascarpone, ricotta, cottage cheese</p> <p><b>Full-fat salad dressings*</b> Honey, olive oil, vinegar, butter</p> <p><b>Full-fat cheeses</b> Cheddar, Brie, mozzarella, Swiss, provolone, Parmesan, blue, Gouda, and many other varieties</p> <p><b>Sauces*</b> Hollandaise, Beurre blanc, pesto, mayonnaise, aioli</p> <p><b>Other</b> Nuts, seeds, avocados, olives</p>
<p><small>*Look for ones without thickeners or added sugars.</small></p>		



# Ketogenic Diet in the Treatment of Neurological Diseases

## Alzheimer's disease (AD)

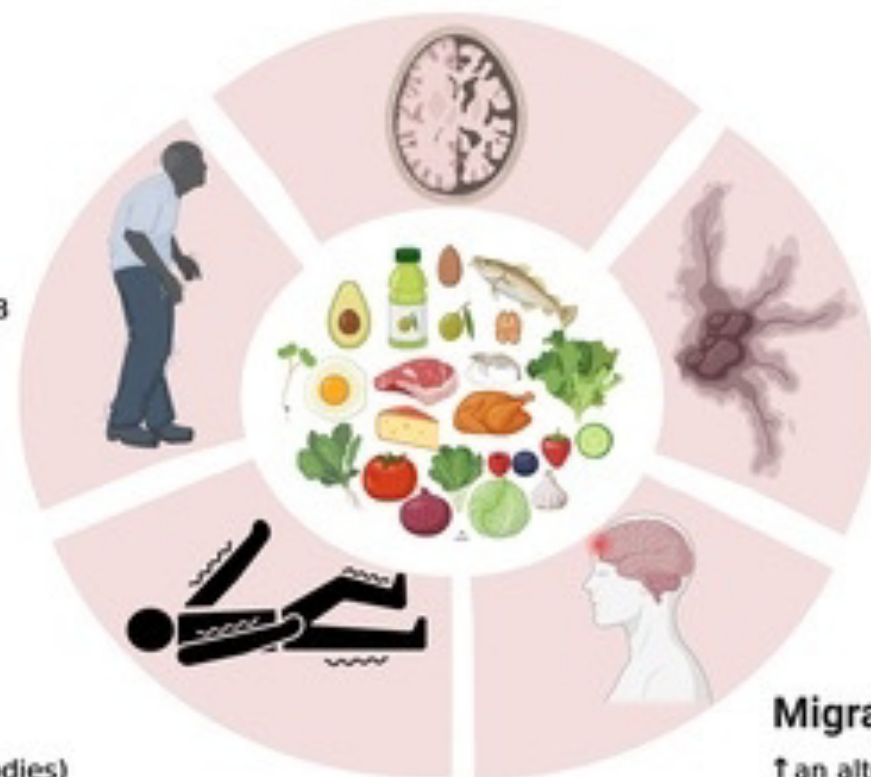
- ↓ inflammation in the brain
- ↓ brain insulin resistance
- ↑ compensation of glucose deficiency in the brain
- ↓ deposition of amyloid plaques in the hippocampus
- ↓ activation of microglia

## Parkinson's disease (PD)

- ↓ dopaminergic neurodegeneration
- ↓ mitochondrial deficit
- ↓ death of dopaminergic neurons
- ↑ modulation of the Akt/GSK-3 $\beta$ /CREB signaling pathway mediated by histone acetylation of the mGluR5 promoter region

## Multiple sclerosis (MS)

- ↑ neuroprotective effect
- ↑ BDNF synthesis
- ↓ sNfL level
- ↓ ALOX5, COX1, COX2 expression
- ↑ neural regeneration



## Epilepsy

- ↑ anticonvulsant effect (ketone bodies)
- ↑ ability of  $\beta$ -hydroxybutyrate to directly activate KCNQ2/3 channels
- ↓ levels of glutamate and pro-inflammatory cytokines
- ↓ glucose availability
- ↑ synthesis of the neurotransmitter GABA and adenosine A1
- ↓ AcAc inhibits voltage-dependent Ca<sup>2+</sup> channels (VDCC) and reduces EPSC

## Migraine

- ↑ an alternative source of energy for the brain
- ↑ influence on disturbed metabolism of brain cells

# Anti-Neuroinflammatory (ANI) Diet

- It's established that inflammation impacts heart health. But studies show inflammation also may signal declining brain function.
- Higher levels of inflammation “negatively affect” cognitive processes, including speed of processing, global cognitive function and memory.
- Certain foods lower the chances of brain inflammation:
  - Oily fish
  - Nuts
  - Chia seeds
  - Avocadoes
  - Cacao
  - Leafy vegetables
  - Spices- turmeric, ginkgo biloba, ginseng and cinnamon.

## FOODS THAT FIGHT INFLAMMATION

Chronic inflammation has been linked to cancer, heart disease, diabetes, arthritis, depression, and Alzheimer's. Fight inflammation with a healthy diet.



### ANTI-INFLAMMATION FOODS



Tomatoes



Fruits

Strawberries, blueberries, oranges, and raspberries



Nuts

Almonds, walnuts, and other nuts



Olive oil



Leafy greens

Spinach, kale, collards, and more



Fatty fish

Salmon, mackerel, tuna, and sardines

### INFLAMMATION FOODS



Fried foods



Sodas



Refined carbs



Lard



Processed meats

# Special diets and conditions

- MS:

- <https://www.mssociety.org.uk/care-and-support/everyday-living/eating-and-drinking/special-diets-and-ms>
- <https://mstrust.org.uk/information-support/diet-ms/types-diet>

- MSA:

- <https://www.multiplesystematrophy.org/about-msa/neuroprotective-diet-msa-patients/#:~:text=Prepare%20fresh%20foods%20at%20home,with%20omega%2D3%20fatty%20acids.>

- Brain Tumours:















- <https://www.thebraintumourcharity.org/living-with-a-brain-tumour/health-fitness/diet/>



# Top tips

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- Healthy balanced diet
- Seek specialist advice re how diet may interact with specific medications
- Keep regular bowel movement
- Keep hydrated
- Food diary/ calorie tracking apps
- Know your weight
- Know your blood sugars
- Know your blood pressure
- Know your cholesterol levels
  
- Consult a specialist dietician as required
- Before taking supplements consult specialist team / GP

 Blueberries	 Eggs	<b>FEED YOUR BRAIN</b>	 Strawberries
 Spinach	 Coffee	 Chocolate	 Beans
 Flaxseed	 Nuts	 Broccoli	 Carrots
 Wild salmon	 Avocados	 Raspberries	 Bell peppers