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Pain Management Programme

Nutrition

This leaflet will cover the following topics

- Food for thought
- Chronic pain and the microbiome
- Central sensitisation from the gut
- Western diet and pro-inflammatory foods
- Ultra processed, processed, and unprocessed foods
- Allergies Gluten/Lactose
- Other pro-inflammatory foods and eliminating these.
- Adding in anti-inflammatory foods/diets
- Obesity and Pain, and the social aspect to food

Food for thought

What you eat can have a big impact on:

- Level of pain
- Feelings and mood
- Sleep
- Digestive system
- Immune system
- Energy levels.



FOOD *for* THOUGHT

Putting the right foods into your body can help to improve your levels of pain, your feelings and mood, your sleep, your digestion, your immune system, and your energy levels. Food really can be medicine, and your diet should be an important part of your treatment plan.

Research has shown that an anti-inflammatory diet can be beneficial for people struggling with pain. Inflammation is a normal and healthy process that is part of our immune system to fight off illness. However, when the body becomes chronically inflamed this can contribute to various diseases and conditions.

Chronic pain and the microbiome



The microbiome is a collection of 100 trillion microbes that live on or inside us, Microbes are organisms that are too small to be seen without using a microscope and are mostly bacteria, fungi, viruses and archaea (aa-kee-uh). Collectively they are called Microbiota. Microbiota and genes together are called the microbiome. They digest foods that we eat, as well as digesting foods that we can't handle ourselves like some types of fibre. They process and detoxify many of the dangerous chemicals that we eat and most importantly they train and regulate the immune and nervous system of the intestine (the second brain) and indirectly, the body and the first brain via the vagus and microglia cells. They also prevent the growth of more dangerous bacteria when they are looked after. However, our modern lifestyle is causing the normal diversity of the microbiome to be lost and disturbed.

Central sensitisation from the gut

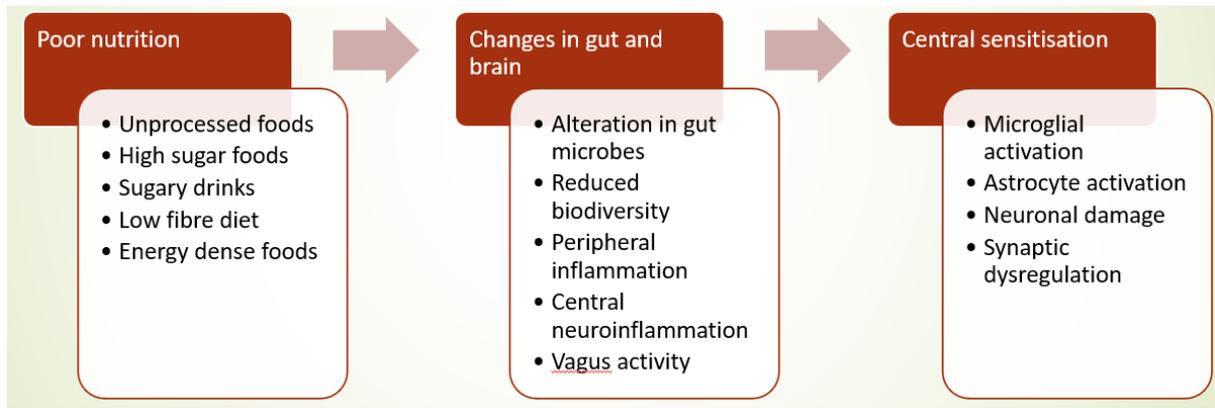
Human immune cells are found in greater numbers in the gut than anywhere else in the body. 60-80% of our immune system is in our intestinal wall and our intestinal wall is only one cell thick. So, it makes sense to mobilise the body's defence forces where they are needed the most. This activation of the defence forces can mean that they can release potent chemicals to protect the body from unhealthy or bad microbes. In the process, if some of those chemicals enter our blood stream, they can contribute to fatigue and central sensitization.

Central sensitization is hypersensitivity to stimuli from things that are not normally painful.

For example – if you generally have a poor diet or poor nutrition (low in fibre and energy-dense, meaning lots of Carbs) with no long term proteins, vitamins or nutrients (classic meal would be burger and chips) you have a higher chance of inflammatory chemicals in your body being produced as a result of that diet.

(The vagus nerve is the longest nerve of the organism and a major component of the parasympathetic nervous system which constitutes the autonomic nervous system). (Microglial – is the resident immune cells of the CNS. Astrocytes are a type of cell in the CNS, that perform diverse functions in health and disease. once activated can cause inflammatory.

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Western diet and pro inflammatory foods

High in processed food	High in calories	High in unhealthy fats	Processed carbs
High in salt	Chemicals and preservatives	Poor in fibre	Low in micronutrients and antioxidants

When you think of a western diet you would think mostly of foods again like burger and chips, pizza, pasta etc. Western foods generally are high in processed foods, high in calories, high in unhealthy fats, processed carbs, high in salts, chemicals and preservatives, poor in fibre and low in micronutrients and antioxidants, making them all pro inflammatory.

Processed, ultra processed, and unprocessed foods.



Processed foods are when they have been extracted and concentrated to extend shelf life by milling, refining or hydrogenation. They are acceptable in small quantities.

Examples: Butter, cheese, margarine, sugar, maple syrup, flour containing lactose and gluten, cream, corn syrup, dried fruits

Ultra Processed foods are often highly processed by baking, frying or deep frying. They have additives, flavours and preservatives and can trigger the brain reward centres.

Examples: Bacon, white bread, biscuits, cakes, chips, doughnuts, ice cream, crisps, sausages, and smoked/cured meats



Unprocessed foods are picked straight from the orchard or farm and are usually in their natural state. This means they have had minimal processing e.g. washing/drying.

Examples: Fresh or frozen fruit/vegetables/poultry/meat/seafood/eggs/raw shelled



nuts/seeds, intact whole grains and naturally fermented foods like miso, kimchi, and sauerkraut/chutney.

Allergies – Gluten/Lactose

It is important to be aware of allergies, such as gluten or lactose allergies.

Gluten are proteins that are found in wheat, barley, and rye. I can activate the immune system in certain populations causing intolerance and allergies. Gluten intolerance can affect your skin, digestive system, mood and cause aching joints.

Lactose is a sugar present in milk. Some people lack the enzyme to break down lactose. If you have a Lactose intolerance – stomach pain or discomfort, bloating, diarrhoea or constipation, flatulence, nausea.

Other pro-inflammatory foods

Polyamines are small compounds found in all living cells, mammals, plants etc. An excess of polyamines can increase the nervous system activity which cause pain to be amplified. Examples of foods that are high in polyamines include orange juice, carbonated or fizzy drinks, potato, especial potato crisps. Therefore, reducing polyamines can help in improving pre-existing pain sensitivity.

Caffeine can sometimes improve pain, when taken with paracetamol, caffeine can disturb sleep and the combination of chronic pain and sleep disturbances is likely to be worsened if you consume caffeine. It is recommended that any caffeine is taken at least 4-5 hours prior to your time for sleep.

Sugar in any form is very inflammatory and any modifications of sugar such as fructose or high –fructose syrup, are all inflammatory. It is present in most foodstuff and therefore difficult to avoid. Some examples are listed here. Biscuits, chocolate, flavoured yoghurts, breakfast cereals and fizzy drinks, sugars in honey, syrups, unsweetened fruit juices, vegetable juices and smoothies.

The NHS recommend adults no more 30g of free sugar per day. Children 7-10 no more than 24g (6 sugar cubes) and children 4-6 no more than 19g of free sugars a day (5 cubes). No guidelines for children under the age of 4. but they recommend they avoid sugar sweetened drinks with sugar added to it.

Excitotoxins such as glutamate or aspartame are small amino acid molecules often added to food to improve taste. They act as excitatory neurotransmitters.

Glutamate is often seen in yeast extract, gelatin, textured protein/hydrolyzed protein, carrageenan, soy protein.

(Uh-spaa-taym) Aspartame – is a common constituent of low-calorie sweeteners, sugar free sweets and gum. It is often added to food to enhance flavour and improve taste. Food additives can stimulate some nerve cells and cause excitation. Excitation can become excessive or prolonged. Foods rich in excitotoxins can cause nervous system changes.

Other pro-inflammatory foods to avoid/reduce especially if you are in pain due to central sensitisation are red meats, certain oils and fats, white bread, rice and corn

cereals, fizzy drinks, fruit juices, energy drinks and flavourings. Also sweets, biscuits/cakes/pastries/doughnuts/pies and sugary desserts.

Anti-inflammation Diets

For chronic pain there are anti-inflammatory diets that help balance tissue pH level for optimal mitochondrial enzyme functioning: mitochondrial dysfunction is a root cause of many illnesses including pain related conditions.

Mitochondrial produces most of your energy your body needs. So if its dysfunctional, they are not producing enough energy.

The Mediterranean Diet

Whilst there are several foodstuffs that are now proven to be anti-inflammatory, a broad approach would be a healthy diet that incorporated this. You've probably heard of the Mediterranean diet – this is a great example of a diet which has been shown to lower inflammatory markers in the system. The Mediterranean Diet is recognized by the World Health Organization as a healthy and sustainable dietary pattern, which means that, unlike some other diets, it's not a difficult one to follow and stick to.



ALKALINE FOODS	ACIDIC FOODS
Alfalfa	Beef
Celery	Ice Cream
Barley Grass	Ice Milk
Peppers	Peanuts
Beet Greens	Canned Fruits
Broccoli	Bacon
Gabbage	Corn
Mustard Greens	Sugar
Chard Greens	Onions
Collard Greens	Vinegar
Chlorolla	Tuna
Cucumber	Corn Syrup
Dulica	Mustard
Edible Flowers	Mayonnaise
Garlic	Milk
Green Beans	Sardines
Kohlrabi	Artificial Sweeteners
Lettuce	Ketchup
Wheat Grass	
Sprouts	
Watercress	
Wild Greens	

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Alkaline Diet

An alkaline diet is rich in fruits, vegetables, seeds, nuts, fish, natural yoghurt, beans and legumes and is the preferred choice if you are in pain. Processed foods and high GI foods makes our bodies more acidic.

Anti-inflammatory Carbohydrates

Anti-inflammatory carbohydrates include sweet potatoes, carrots, or parsnips, which are quite useful to consume as part of a low carbohydrate diet.

Anti-inflammatory Fats

Anti-inflammatory fats include Omega-3 unsaturated fatty acids that can be found in fish such as mackerel, herring, and salmon. Foods like flaxseed and almonds and switching to olive oil is a good way to increase your Omega-3 intake.



Anti-inflammatory Foods

The anti-inflammatory foods you should eat to reduce inflammation include:

- **Whole grains:** wholegrain bread, oats (steel cut), brown rice, barley, bulgur wheat, quinoa, couscous, polenta, and rye bread.
- **Beans/nuts/seeds:** black beans, kidney beans, chickpeas, hummus, nuts and seeds like walnuts, almonds, pecans and peanuts, sunflower seeds, flax seed, pumpkin seeds and legumes like edamame beans and sugar snap peas.
- **Fruits:** berries, cherries, and dark-coloured fruits.
- **Vegetables:** peppers, tomatoes, spinach, kale, leaf lettuce, mixed greens, dark and leafy greens, broccoli, sprouts, cauliflower radishes and cucumbers.
- **Oils:** Olive oil and coconut oil.
- **Fish:** Salmon herring, anchovies, sardines, and mackerel.
- **Tea:** black tea, green tea, white tea, and herbal tea.
- **Chocolate:** dark chocolate > 70% cocoa.
- **Wine:** red wine (no more than 14 units a week).
- **Sources of fibre:** raspberries, blueberries, avocado, broccoli, nuts, seeds, beans, cauliflower, kale, and apples.

Essential Nutrients and multivitamins

Another problem of highly processed foods and takeaway culture is the reduction in essential nutrients and various vitamins. Vitamin deficiencies can contribute to chronic pain and mood disorders. A balanced quantity of vitamins and minerals are

needed and, if natural food does not have enough, then the use of multivitamins and other supplements needs to be considered.

Vitamins and minerals	
Vitamin A	Helps in detoxifying certain harmful substances.
Vitamin B	Is a complex of 8 vitamins with B12 being most relevant for pain worsening, especially when it is deficient. Vitamin B2 can be useful in migraine relief and Vitamin B6 in premenstrual cramps.
Vitamin C	Powerful antioxidant is needed for muscle and ligament repair.
Vitamin D	(sunshine vitamin) required for about 200 genes to function we.. Helps in boosting immune system, preventing diabetes and muscle strength. Deficiency can cause widespread pain.
Vitamin E and K	Act as antioxidants so have powerful anti-inflammatory effects.
Minerals like Calcium	Often useful for bone strength alongside Vitamin D, and low calcium can often cause muscle pain.
Magnesium	Hugely important for the energy factories of our cells (mitochondria). Low magnesium can worsen muscle pain and cause weakness. It can help in IBS, improve sleep and reduce pain.
Chromium, Iodine, Iron	Evidence is still being developed, deficiencies of these trace elements can worsen pain or diabetes control.
Zinc and Selenium	Both have antioxidant properties and are increasingly recommended for pain conditions.

Antioxidants

Antioxidants also have anti-inflammatory effects. Antioxidants is a substance that protects cells from the damage caused by free radicals. A broad umbrella term for antioxidants are 'Polyphenols'. They are found in a variety of foods, especially in the skins of fruits and vegetables. Overall, the aim is to eat more vitamins by consuming lots of fresh vegetables, more coloured and leafy vegetables, and less red meat. In short, we should eat a rainbow.

L-glutamine	Improves neuropathic pain by promoting the body's antioxidant production.
Quercetin	Is plant based and acts as an antioxidant and anti-inflammatory.
CoQ10	Is required by our mitochondria and acts as a powerful antioxidant.
N-acetyl cysteine & alpha lipoic acid	Work in the liver to protect and detoxify a variety of substances and protect the nerve cells and liver.
Resveratrol	Found in the skin of red grapes and mulberries and also in red wine.
Anthocyanins	Found in blueberry skins and cherries and can also help in reducing pain.

Antioxidant – Rich Foods

Antioxidant rice food include spices cloves, berries, vegetables and lots of other foods.

Spices	Cloves, oregano, ginger, cinnamon, turmeric, basil.
Berries/fruit s	Blackberries, cranberries, raspberries, strawberries, blueberries, sour cherries, pomegranate, red grapes, plums, kiwi, prunes.
Nuts/seeds	Walnuts, pecans, flaxseed, sunflower seeds, pistachios.
Vegetables	Kale, red cabbage, spinach, artichokes, broccoli.
Other	Dark chocolate, red wine, green tea, coffee.

Ensure you have good hydration.

While not usually related to pain, it is important that adequate hydration is maintained. Especially with people that have fibromyalgia and chronic fatigue syndrome, they feel that keeping hydrated can reduce their fibro fog and that it improves energy and concentration. Dehydration can make us feel tired, cause headaches, and have poor concentration.

- Hydration can reduce fatigue.
- Clear up fibro fog.
- Improve energy and concentration.
- If we are dehydrated this can make us feel tired, cause headaches and poor concentration.
 - Aim to drink 6-8 glasses of fluid per day.

Obesity and Pain

Obesity can increase the mechanical load on the spine, therefore causing higher pressure forces. A survey of over 1 million Americans has shown that people with a BMI between 30 –34 had 68% more pain, whilst people with a BMI of 35-39 showed 136% more pain. Another research survey in Denmark of 29000 twin subjects noted their obesity was associated with low back pain and played a part in maintaining the chronic nature of the pain. In Australia researchers were able to show that osteoarthritis in the hip and knee was seven times higher in obese patients.

Obesity can put pressure of different areas, causing reduced blood flow and risk of increasing nerve damage.

We know now that people that are obese are likely to feel more pain due to several inflammatory chemicals in their bloodstream. As the chemicals activate the nervous system and causing central sensitisation.

Time of eating

Active research in the last few years has looked at whether the time of eating can be anti-inflammatory. The intestinal clock is regulated by our master clock, and it gets ready with its digestive juices and the good bacteria during the daytime. It also regulates the release of other enzymes to break down harmful products and eliminate them after it gets the signal that the last meal has been completed. Researchers have found that if we keep eating for 16 to 17 hours then the intestinal clock never gets the chance to repair and heal the damaged cells in our intestine wall. It needs 12 to 16 hours of empty time to do this. If Diabetic or have a history of eating disorders advice from doctor or diabetic team needs to be sought prior to any time restricted or intermittent fasting diet.

Social Aspects of eating

The social aspects around eating play a very important role in our food habits, and why and how we eat.

Our context and whom we eat with can have a powerful influence on how much we eat, what we eat and how it effects our mood. Sometimes eating with family and friends in a social setting will keep us more accountable to sticking to healthier habits and certainly we will be influenced by them reciprocally. Eating in isolation can remove these advantages and can further worsen mental health. We should attempt to eat at least one meal a day in a social setting.

Reference

Ravindran, D. (2021)The Pain-Free Mindset. 7 steps to taking control and overcoming chronic pain. London. Ebury Publishing.

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