

Meniere's Disease

Masterclass Feb 2023

By Jan Clementson

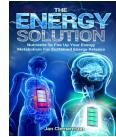
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About Me

Jan Clementson	UK Registered Nutritionist
Qualifications	BSc (Hons) Nut Med - First Class
Professional Bodies	mBANT, CNHC registered
Year of Qualification	2011



Professional Experience

- Founder & Nutritionist – Boundless Energy
- Clinical Nutrition Advisor – BioCare Ltd
- Lecturer (biomedicine) – London College of Naturopathic Medicine (CNM)
- Author – The Energy Solution (Amazon)
- Functional Medicine Practitioner – Abundant Energy Programme
- Student Clinic Tutor – Institute for Optimum Nutrition (ION)
- Lecturer & Module Leader (cardiometabolics) – (ION)
- Lecturer (obesity) – British College of Nutrition & Health (BCNH)



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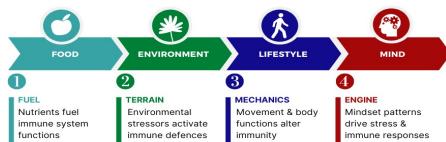
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What I do?

I am a nutritionist and energy expert focusing on healthy ageing. I help prevent or reverse chronic conditions, so that you can live with energy & vitality.

Boundless Energy

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Defining Meniere's

Ear Anatomy

Pathophysiology

Potential Causes

Case History

Recommendations



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What is Meniere's Disease (MD)?

Disorder of the INNER ear affecting balance & hearing

Main Symptoms

- Vertigo – extreme dizziness
- Tinnitus – roaring/ringing in the ears
- Pressure – or fullness in ears
- Hearing – fluctuations or loss in 1 or both ears

Other symptoms - nausea, vomiting, vestibular migraines

Symptom duration – can persist for 1-2 days after an episode.
Tiredness or fatigue after an attack.

Life quality - severe disruption to normal daily activities. Negative effects on mental health. Distress is common.

Similar symptoms – migraines, ear infections, labyrinthitis

www.medlineplus.gov



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Characteristics

- Prevalence – approx. 0.3%. More common in European descent
- Sex – more prevalent in females (approx. 4:1 ratio)
- Genetics – no associated gene found with MD, although a small percentage found to run in families. Likely other genetics at play.
- Life stage – usually adulthood, often 40s or 50s
- Episode timings – unpredictable
- Duration – minutes or hours. Most common: 2-3 hours
- Frequency – may be cluster episodes within a short period, followed by months or years without symptoms
- Progression – typically begins in 1 ear, although may later affect both ears (35%). Permanent hearing loss eventually develops for many
- Prognosis – currently no recognised cure. Just management

www.medlineplus.gov Casale & Agrawal, 2022



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Medical Management

Symptom treatment & providing support

Medicines – taken at the first sign of symptoms

- Prochlorperazine - helps relieve severe nausea and vomiting
- Antihistamines (betahistine) - mild nausea, vomiting and vertigo

Other treatment may be needed for:

- Tinnitus & hearing loss
- vertigo/loss of balance - vestibular rehabilitation

Surgery – decompression of endolymphatic sac or removal of inner ear structures

Counselling – including cognitive behavioural therapy (CBT)

Relaxation therapy – including breathing techniques and yoga

Support groups & organisations - such as **Deaf to Meniere's** and the Meniere's Society that can provide help and advice.

www.nhs.uk

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Ear Anatomy

The ear consists of **3 parts**:

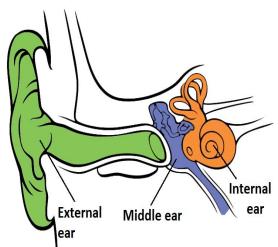
1. Outer or external ear
2. Middle ear
3. Inner or internal ear

MD affects the inner ear

Inner Ear - 2 Main Functions

- 1) Hearing
- 2) Balance

<https://teachmeanatomy.info/head/organs/ear/inner-ear/>

 © teachmeanatomy

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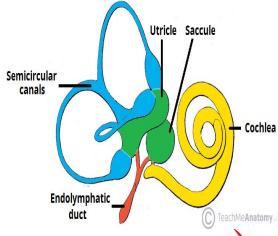
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Inner Ear Anatomy

The inner ear is at the end of the ear tubes. It sits in a small hole-like cavity in the skull bones on both sides of the head

Key Areas:

1. **Cochlea** - auditory area
2. **Semi-circular canals**- senses balance and posture
3. **Vestibule (saccule & utricle)** – also assists in balance equilibrium
4. **Endolymphatic duct (sac)** – drains/regulates fluid from cochlea & semi-circular canals. Immune element

 © TeachMeAnatomy

The parts of the inner ear are attached but work separately to do each job

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Inner Ear Fluid Ducts

Endolymph – inner fluid

- Hair cells conduct sound

Perilymph – outer fluid

- Produces endolymph

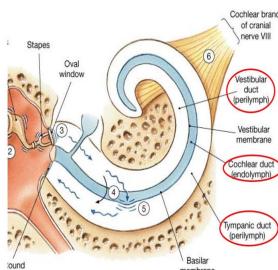
Membrane (Reissner) – separates the 2 fluid ducts

- Selective ion transport

Electrolytes (ions)

- Endolymph - high K⁺ & low Na⁺
- Perilymph – low K⁺ & high Na⁺

K = potassium; Na = sodium

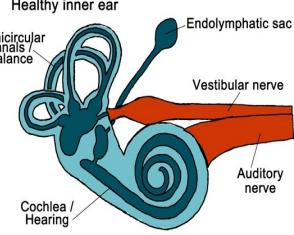
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Ear Nerves

Endolymphatic fluid waves generated by mechanical vibrations result in the transmission of electrical nerve impulses to the brain, which translates it into sound frequencies



<https://vestibular.org>

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Endolymph Fluid

- Function** - serves crucial sensory functions.
- Head movement** – causes changes in speed &/or direction of the fluid
- Vibrational waves** – created by fluid movement
 - Transmitted through the fluid to sensory neural structures that convey information about sound & position
- Specialised fluid** – similar to fluid inside of cells
 - Only fluid not to follow the general fluid movement of body
 - Contains electrolytes - high K ions & low in Na/Ca. Opposite to perilymph. K ions essential for neuronal firing
 - Produced continuously in specialised cells lining the cochlea and the ampulla of the semi-circular canals
- Fluid regulation** - via the endolymphatic sac

Casale & Agarwal, 2022



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Perilymph Fluid

Serves as a connection with cerebrospinal fluid (CSF)

- Perilymph regulation** – via CSF. Composition similar to CSF
- CSF pressure changes** - affects water flux into perilymph
- CSF pressure regulation** – via BP & electrolyte levels
- CSF Function**
 - Protective fluid cushions the brain & spinal cord. Secreted in brain
 - Helps transport nutrients & hormones from one area to another
 - Removes waste products & excess fluid. Drains into blood
 - Regulates nerve functioning

Bothwell et al, 2019



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Endolympathic Sac

Regulates endolympathic fluid

- Connected to blood vessels that allow fluid to pass between membranes
- Drains fluid from cochlea & semi-circular canals** - via saccule & utricle
- Secretes glycoproteins to attract extra fluid
- Removes metabolic & cellular debris
- Maintains ion levels - high K levels and low Ca levels critical for sensory conduction in the cochlea

Immune defence mechanism

- Main site of immune activity of the inner ear** – can generate immune responses
- Inactivation and removal of viruses**

Oberman et al, 2017



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The Path of Sound - Hearing

From outer ear to inner ear

Outer ear - acts like a funnel. Sends sounds into the ear canal from the outside world

Middle ear - sound waves travel down ear canal to the eardrum in the middle ear. Makes eardrum vibrate & move 3 tiny bones in middle ear

Inner ear – movement from middle ear to inner ear leads to pressure waves. **Makes the fluid inside of the cochlea move**

- Causes tiny hairs in cochlea to bend and move – this converts the movement from sound waves into electrical signals
- Electrical signals** are sent to the brain through the hearing (auditory) nerves. This makes a sound



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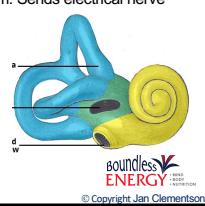
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Balance Mechanisms

Movement Sensors

Semi-Circular Canals

- 3 loop-shaped tubes filled with liquid and lined with fine hairs
 - hairs act like sensors for body movement that help with balance.
- Sit at right angles to each other** - helps measure motion & position
 - When your head moves around, the fluid inside the semi-circular canals shifts around. This moves the tiny hairs inside them. Sends electrical nerve messages to brain



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Vestibule

The semi-circular canals connected by "sacs" in the vestibule (**saccule & utricle**) that have more fluid and hairs in them.. They also sense movement

Video Animations of the Inner Ear

Hearing - Cochlea

<https://www.youtube.com/watch?v=qgdqp-oPb1Q>

Balance – Semi-Circular Canals

<https://www.youtube.com/watch?v=YMIMvBa8XGg>

The Vestibular System Endolymph Motion Demonstration

<https://www.youtube.com/watch?v=dSHnGO9qGsE>



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MD Pathophysiology

Clinical definition
Idiopathic (unknown) syndrome of endolymphatic hydrops

Endolymphatic hydrops - excessive fluid build up of endolymph fluid in the hearing and balance structures of the inner ear

MD attacks - fluid build up causes progressive distension of the ducts:

- Pressure fluctuations damage ear membranes
- Temporary leak in membrane separating perilymph & endolymph
- Fluid mixture can lead to a temporary electrical blockade
- Disrupts electrical signals to the brain causing loss of sensory function in relation to hearing and movement
- Degree of fluid build up correlates with degree of hearing loss

American Academy of Otolaryngology (1995), Salt & Plonk (2010)



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Membrane Rupture

Leads to the fluid of the inner and outer ducts mixing together

- **Inner fluid (endolymph)** - Na mixes into the K compartment
 - Na intoxication of the sensory cells – hearing declines
- **Outer fluid (perilymph)** - K mixes into the Na compartment
 - Upsets balance system – ‘floaty-boat’ sensation or vertigo attack

❑ **Ruptured membrane heals**, but re-establishing equilibrium of Na and K may take a while

❑ **Hearing and balance sensory cells suffer both reversible and irreversible intoxication**

❑ With each successive attack, injury to the inner ear accumulates



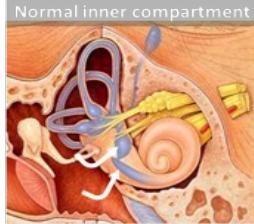
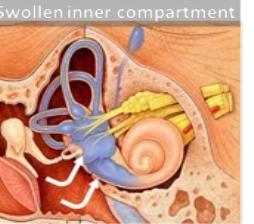
<https://www.tampabayhearing.com>

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Inner Ear Swelling

Rapid swelling of the **inner chamber** appears to rupture the thin separating membrane between the two compartments.

The pressure problem is thought to increase in the hours to days before the inner ear ruptures

<https://www.tampabayhearing.com>



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Overview of Potential Causes

A 2017 review of multiple studies found

```

    graph TD
      A[Inner ear pressure regulation failure] --> E[Endolymphatic Hydrops]
      B[Hemodynamic Disequilibrium] --> E
      C[Allergy and Autoimmunity] --> E
      D[Genetic predisposition] --> E
      E[Endolymphatic Hydrops]
      F[Reissner membrane rupture] --> E
      G[Clinical manifestation of Meniere's disease]
      H[Hormonal mechanisms] --> E
      I[Disruption of the endolymph secretion] --> E
      J[Decreased Endolymph Clearance] --> E
      K[Oberman et al, 2017]
  
```

Oberman et al, 2017



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Potential Causes

The reason for inner compartment swelling is not definitively known but it does appear to be **multi-factorial**

- Trauma to the inner ear
- Dysfunctional blood flow
- Ion transport dysfunction - sodium/potassium ions (Na/K)
- Ear Pressure regulation
- Stress hormonal connection
- Allergies and sensitivities – food and environmental
- Immune dysfunction – inflammation and autoimmunity
- Viruses, bacteria, mould
- Heavy metals
- Oral health
- Genetics
- Nutrient deficiencies or imbalances

Oberman et al., 2017



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Blood Flow Dysfunction

Dysfunctional cochlea blood flow

- Significantly higher rate of chronic blood insufficiency found in MD in the veins of the **head and neck** compared to controls

Blood/perilymph barrier dysfunction

- Blood barrier – between blood capillaries & perilymph critical for maintenance of ionic composition of perilymph
- **Barrier breakdown found** - changes to blood vessel walls
- Permeability alteration – increases ion transport from blood
- **Barrier dysfunction may be one of the primary causes MD**

Bacterial link?

LPS (lipopolysaccharides) known to break down the blood barrier & to stimulate immune system. Found on many bacterial walls.

Oberman et al., 2017, Ishiyama et al., 2017



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Ion Transport Dysregulation

Emerged as a KEY aspect

Endolymph balance more dependent upon ion transport & osmotic gradient than fluid volume

- **Ion channels** - crucial to regulation of endolymphatic fluid composition
- **K ions** - integral to electrical firing of nerves
- **Elevation of Na-K ATPase enzyme levels** - in cochlea area that produces endolymph. Increases pump activity.
- **Enhanced K secretion into endolymph** - increase the rate of endolymph production. Creates volume excess endolymphatic sac
 - Increased K levels can increase nerve hyperexcitability
 - Tinnitus linked to nerve hyperexcitability
- **Hormonal dysregulation of the water channels** – may play a role in fluid movement changes

Casale & Agarwal, 2022, Knipper et al., 2020, Boerio et al., 2014



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Ear Pressure Regulation

- **Inner ear pressure** – multiple studies reported pathological pressure changes in the cochlea and vestibular fluids
- **Inner ear muscle spasms** – can also occur with both MD and tinnitus
- **Symptoms** - thought to be caused by an excess accumulation of endolymph causing progressive distension of the ducts.
 - Pressure fluctuations damage the thin membranes of the ear that detect balance and sound.

Oberman et al., 2017



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Stress Hormone Connection

Stress – Both A Cause & Effect

- Elevated stress and anxiety often accompany vestibular dysfunction
- Vestibular symptoms are effective in activating the stress axis

Stress Hormonal Mechanisms in Inner Ear

The mechanisms are not fully understood but may influence inner ear function either

- **Directly** - via cortisol on **ion channels** & brain neurotransmission
- **Indirectly** – via stress-related neuroactive substances (e.g, **histamine**, neurosteroids)

Saman et al., 2012



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Key Stress Hormones

Adrenaline aka Epinephrine

- Increase K secretion in the cochlea
- Increase ADH secretion – water balance hormone

Cortisol

Higher serum cortisol levels found in MD. The longer the MD duration, the higher the cortisol levels.

- Anti-inflammatory & immune suppressive.
- Steroids used for some MD cases for anti-inflammatory & immune suppressive effects. But this therapy for inner ear poorly understood

Renin-Angiotensin-Aldosterone System (RAS)

Also stimulates ADH hormone

Oberman et al., 2017; Groeschel M & BraamB; van Cruyssen et al., 2005



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Water-Balance Hormone

Antidiuretic Hormone (ADH) aka Vasopressin

Significant increase in ADH during MD attack

ADH function – regulates water & salt (ions) balance

- Produced in brain & acts on the kidneys
- Increases blood water volume through constricting blood vessels, increasing Na levels & water reabsorption, reducing urine output

What can cause the release of ADH?

- Increased blood osmolarity (high solutes/ions in blood)
- Reduced water volume of blood
- Stress hormone activation – (cortisol, adrenaline & RAS)
- Negative emotional states, such as pain, anger, etc.
- Infections

Oberman et al, 2017



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Allergies or Intolerances

• Allergy percentages – confirmed or suspected in MD studies

➢ Airborne = 60%; Food = 40%

• Food allergens/intolerances - multiple studies found wheat is the most common food allergen (68%)

- High levels gluten (gliadin part) sensitivity also found
- Individual reactivities, ability to detox, gut conditions

• Inhalant allergies – changes in cochlea fluid retention found in MD following an inhalant allergy challenge

• Inflammation – allergies/intolerances activate immune system & create inflammation, which affects the whole body

Oberman et al, 2017; Pathak et al, 2013; De Beradino & Cesarani, 2012



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Proposed AI Mechanisms in MD

Endolymphatic Sac (ES) – potential target of allergic reaction via connected blood vessels

1. ES can allow entry of an antigen via blood vessels
 - Toxin, foreign substance, virus, food-immune complex, antibody, histamine (released elsewhere), immune memory cells from reactivation of childhood infections/ viruses
2. Stimulates immune cells in connective tissue causing inflammation & reducing sac's filtering capability
3. Results in toxic accumulation of metabolic products & inflammation that interferes with hair cell function

Oberman et al, 2017



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Viruses & Hearing Loss

It has been recognised for some time that hearing loss (*unilateral or bilateral*) can be caused by viruses via:

- Directly damaging inner ear structures, or
- Inducing inflammatory responses which then cause this damage, or
- Increasing susceptibility to bacterial or fungal infection

Specific Viruses

- Cytomegalovirus (CMV), rubella (measles) rubella (German measles), HIV, herpes simplex (HSV), varicella zoster (VZV) (chickenpox/shingles), mumps, West Nile (WNV), Epstein Barr (EBV)
- Herpes virus family – CMV, HSV, VZV, EBV
- **HSV – found in the inner ear of 75% of MD cases (Tampabay)**

Cohen et al, 2014



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Reactivation of Childhood Viruses

Those found in MD cases so far:

- Herpes simplex virus (HSV) – found in perilymph
- CMV – 3 fold increase found
- Herpes family viruses – main viruses that affect MD

- May represent the development of bilateral MD – occurs in around 15-50% of MD
- Virus reactivation – toxicity can damage the vestibular nerve endings
- Depends on viral load on the sensory neurons
- Anti-viral drugs found to help some where symptom duration 2 years or less

Gacek, 2021; Dean et al, 2019 Oberman et al, 2017



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Viral-Fungal Co-Infections

Respiratory viral infections now emerging as a risk for invasive fungal co-infections

- Viral infection lowers immune responses allowing for opportunistic fungal infection. Fungal infection complicates viral infection.
- Primary viruses – influenza & covid

Fungal Characteristics

- **MD subset** – primary moulds Aspergillus & Penicillium. Plus Candida
- **AI trigger** - fungal exposure can trigger AI in the inner ear in some
- **AI comorbidities** – often other co-existing AI conditions, such as RA
- **Specific immune molecule** - Aspergillus has been shown to upregulate a specific immune cytokine (IL-1 β) linked to hearing loss
- **Cross-reactivity** - between mould and cochlin in inner ear observed

Salazar et al, 2022; Frejo et al, 2018 Pathak et al, 2013



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Heavy Metals

- Common heavy metals** – mercury, arsenic, cadmium, nickel, lead, aluminium
- Present in environment – high levels can be toxic to body
 - Hearing loss** – **heavy metals shown to cause hearing loss**
 - Damage to hair cells & auditory nerves
 - MD - more specific research in this area needed

Mercury Amalgam Dental Fillings

International Academy of Oral Medicine & Toxicology (IAMOT)

- Low levels of mercury vapour released from fillings
- 80% absorbed by lungs & passed to rest of body – especially brain, kidneys, liver, lungs, GI tract
- Accumulates in body fluids & tissues – can stay in brain for decades
- IAMOT lists **hearing loss as a common symptom** associated with inhaling mercury vapour

Castellanos & Fuente, 2016; www.iamot.org



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Oral Health & MD

Poor oral health linked with increased risk of MD – especially where periodontitis & missing teeth

TMJ/TMD (temporomandibular joint dysfunction)

- Symptoms - very similar to MD symptoms
- **Clear association of MD with both TMJ & CSD (cervical spine disorders)**

 - Spine connected to ear via CSF. CSF affects water movement into the perilymph & regulated via BP & electrolytes (ions)

- **Potential causes** – trauma, teeth grinding, wear & tear, degenerative joints (OA & RA), bacterial infections (including periodontitis & Lyme disease), septic arthritis (bacterial or fungal infection), heavy metals
- **Direct proportional relationship found between jaw dysfunction & heavy metals, including mercury from dental amalgam**

Park et al, 2022; Jovanovic et al, 2021; Weise et al, 2021; Jeon et al, 2017; Di Paolo et al, 2014; Edelman, 2007; Bjorne & Ayerberg, 2003



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Genetics

- No specific genes yet identified for MD per se
- Several genes probably play a part in susceptibility
- Genetic predispositions provide susceptibility. Environmental factors may then be sufficient to induce disease symptoms

Gene Associations

- HLA-C gene** – linked with MD. Potential genetic predisposition to MD
- **HLA genotype** – helps regulate immune response
 - Strongly associated with AI conditions
 - Specific mutation impairs ability to detox mould mycotoxins in 25% of people
 - Another mutation responsible for coeliac disease – gluten allergy & intolerance
 - Worse outcomes with covid – tinnitus link?

Detoxification genes

- **Methylation** - 12 specific mutations found in MD. Under-methylation.
- Glutathione enzymes (GST) - gene deletions predisposes to hearing loss. GST found in cochlea

Flook et al, 2021; Migliorini et al, 2021; Pathak et al, 2013; Khorsandi et al, 2011; Bared et al, 2010



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Key Nutrients – Magnesium (Mg)

- **No.1 supplement recommendation**
- **Energy requirements** - inner ear & immune responses requires a lot of energy for proper function
- **Body's energy molecule** – **ATP** (adenosine triphosphate)
 - Mg essential to ATP function – it attaches to the molecule to activate it
 - Metabolic disorders – linked to hearing loss
- **Key electrolyte** - cellular pump (Na/K ATPase). Mg activates pump
 - Maintains ionic balance inside/outside of cells & between perilymph/endolymph
- **Mg deficiency** – prevalent in the population
 - Stress & an activated immune system increase usage & can lead to deficiency
 - Blood Mg levels correlate with perilymph Mg levels
- **Mg supplementation** - found to reduce hearing loss, vertigo/dizziness, headaches/migraines, vestibular damage

Chiarella et al, 2021; Sendowsik et al, 2011



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Vitamin C

- **Natural anti-histamine** – reduces amount histamine produced in response to allergens
 - Decreases inflammation, swelling & symptoms of allergic reactions
 - Acts differently from anti-histamine meds – it reduces the amount of histamine produced rather than blocking receptors
 - Histamine levels may reduce by around 38% after 2g vit C
- **Stress** – **vitamin C restores stress response**. Works synergistically with stress hormones (*cortisol, adrenaline*)
- **Anti-inflammatory/anti-oxidant** – Vit C reduces oxidative stress (*caused by reactive by-products of metabolism*)
 - Oxidative stress role in MD. Damage to hair cells increases the release of a nerve messenger (glutamate). Cause **hyperactivity in nerve transmission** leading to **tinnitus**
- **MD research** – Japanese study found improvement with vertigo, tinnitus & hearing loss with just 600mg/d for 8 weeks

Marki 2020, Pellow et al, 2020, Prasad, 2019, Branco et al, 2018, Takcumida et al, 2003, Johnston et al, 1992



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Key Nutrients – Vitamin D

- **Key immuno-modulator in ear disorders**
- Huge role in immune **mucosal defences**
- Deficiency linked to:
 - Increased risk for allergic disorders, including fungal sinusitis
 - Chronic tonsillitis, autoimmunity, contagious diseases, vertigo
 - Elevated risk for respiratory tract infections
 - Adversely affects lymphatic flow – nasal passages rich in lymph
- Disturbed lymphatic flow - negatively affects muscle physiology
 - Vit D levels should be assessed with TMJ
- **MD** – vit D found to be significantly lower than control groups, whilst deficiency found in many new cases of MD
- 95% vitamin D acquired through sunlight

Bahksaee et al, 2022; Bulut & Ballicia, 2021, Buki et al, 2018



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Key Nutrients – Zinc (Zn)

- Inner ear (cochlea & vestibule) contain the highest Zn levels of body
- Deficiency found in balance disorders, tinnitus & hearing loss
- Protects hair cells against toxins & reactive by-products of metabolism (free radicals)
- Critical role in anti-inflammatory pathways, including allergic disorders & inhalant allergies (allergic rhinitis)
 - Allergic rhinitis – hayfever, mould allergies
 - Histamine plays a huge part in allergies
 - Zn reduces histamine release by inhibiting release from immune cells
 - Zn deficiency associated with lowered immune response, reduced tonsil defences & a likelihood of developing oral bacterial or fungal infections
 - Stress significantly lowers Zn levels

Bulut & Balicci, 2021; Shambaugh, 1989



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Key Nutrients – Iron (Fe)

- Iron-deficiency anaemia associated with hearing loss & early MD
 - Fe supplementation found to resolve hearing loss where iron-deficiency
 - Complete recovery from sudden hearing loss found to be significantly more difficult where low blood Fe levels
- Iron required for:
 - Oxygen transport – inside RBCs. Inner ear needs high blood oxygen for proper function. Reduced flow – tinnitus & hearing loss
 - Energy production – inside of the cell
 - Nerve function – damage to the auditory nerves protective lining (myelin sheaths) impairs electrical conductivity of sound. Can result in tinnitus & hearing loss.
 - Immunity – necessary for immune cells that respond to infections (lymphocytes). But body can reduce Fe levels in response to pathogens
 - Detoxification – low Fe impairs gallbladder motility & bile flow. Reduced detox.

Taki et al, 2021; Kurioka et al, 2021; Schieffer et al, 2017; Banim et al, 2010;

Soyano & Gomez, 1999

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Key Nutrients – Methylation

Homocysteine metabolism emerged as a central role in hearing loss via impaired methylation & sulphation

- Links in with 12 specific methylation gene mutations found in MD
- Methylation nutrients – vitamins B12 & folic acid
- Sulphation nutrients – vitamins B6, Fe, molybdenum
- B12 & folic acid deficiency – linked with hearing dysfunction
- B12 def linked to tinnitus & reduced sensory & motor nerve function
- Omega 3 fats – significantly reduces homocysteine levels
 - Found to reduce hearing loss
 - Supplementation proposed as a promising treatment for MD based on modulating systemic blood changes

Ozdemir et al, 2019 Partearroyo et al, 2017; Singh et al, 2016, Tayebi-Khosroshahi et al, 2013; Leishner et al, 2013; Borghi & Piroddi, 2012



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Other Nutrients

- Ginkgo biloba – circulation. Helps to reduce vertigo
- Ginger – anti-inflammatory. Can reduce vertigo/dizziness
- CoQ10 – key role in energy production, reduces inflammation, modulates immune response, antioxidant
 - Depletion linked to hearing loss & increased susceptibility to infection
 - Supplementation can improve vertigo, tinnitus & MD-like symptoms
- Vit B3 (nicotinic acid) & choline – nerve transmission
 - Acetylcholine neurotransmission principal nerve transmission from cochlea hair cells via the nicotinic cholinergic receptors
 - Receptors found to play a role in hearing disorders
 - Significant reduction in choline levels in ear correlated with acetylcholine levels & severity of tinnitus & hearing loss
 - Reduced levels of B3 & B2 associated with tinnitus – supplementation can help relieve symptoms.
 - B3 & B2 both very important nutrients in energy production

Cecen et al, 2022; Chiarella et al, 2021, Mantle et al, 2021, Lee & Kim (2018);

Eloghyhen et al, 2009; Sedley, 2015



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Defining Meniere's

Ear Anatomy

Pathophysiology

Potential Causes

Case History

Recommendations



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Case History - Frances

Client:	Frances aged 46
Trial Date:	17/01/22 – 24/11/22
Programme:	Revive – Standard 6-month programme
Health Concerns	MD & Vertigo – 1.5 years
Significant Symptoms:	Hearing loss in 1 ear (fluctuates). Vertigo attacks (periodic). Tinnitus (ringing most days. Usually comes with vertigo attacks). Fatigue & foggy headedness (as though about to start a cold); floaty/boat sensation. IBS - bloating, pain, swelling, wind.
Medications:	Bethistine (anti-histamine)
Health History:	Gut problems, candida, repeated thrush attacks, PCOS, bone spurs
Prior to MD Onset :	Moved house 1.5 years before MD onset. Hip up around the time of the move. Old house - lots of DIY/renovating needed that she did. Mould likely in the house (dampness found in footings).

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Testing Key Findings

Mould Questionnaire	High score – mould toxicity likely
Pyroluria Questionnaire	High score – indicating likely chronic deficiencies of zinc and vitamin B6. Often seen with mould toxicity.
Standard GP Bloods	Several imbalances including potential pathogens. Fe levels very low. Indications of low Zn, B12, B6, Vit C
Food Intolerance Test	Positive – multiple foods, including dairy, gluten (gliadin) and high sulphur foods
Gut Function Test	Low immune function, impaired gut barrier, yeast and some opportunistic bacteria
Mould Mycotoxin Test	Positive – 2 types of mycotoxin. Ochratoxin A (aspergillus) & citrinin.



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Frances: Health Plans 1-2

Plan	Category	Recommendations
1	Diet	Hydration – fluid intake, electrolytes, tea/coffee BS balance, proteins, reducing high histamine foods
	Lifestyle	Sleep, stress, Epsom salt baths
	Testing	Recs: Standard GP bloods, VCST, Food Intolerance
	Supps	Mg, B12, B-complex, DHA, Vit C, Moly, turmeric, bitters
2	Diet	Complex carbs, increased high Fe foods (low levels in bloods); reduced/removed specific foods highlighted in food intolerance test & high sulphur foods (flagged in test)
	Lifestyle	Reduced toxic chemical exposure via food & water. Introduced deep breathing & steam inhalation with EO
	Testing	None – addressing what was found in bloods & food intol
	Supps	As Plan 1, plus iron, Ginkgo, green barley grass



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Frances: Health Plans 2-4

Plan	Category	Recommendations
3	Diet	Omega 3 food & healthy fats, liver & bile specific supporting foods
	Lifestyle	Oral hygiene, reduced exposure chems in air & on skin, nervous system re-set, stress/tinnitus sound therapy track
	Testing	Gut function
	Supps	B12 & turmeric removed. Replaced with Immune multi & S.boulardii. Others the same
4	Diet	Rainbow diet & polyphenols, juicing & getting back on track with earlier recs
	Lifestyle	Additional stress strategies, reducing EMF exposure
	Testing	None
	Supps	Mg, Vit C, DHA, molybdenum <i>Frances had covid</i> during this period so paired this back

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Frances: Health Plans 5-6

Plan	Category	Recommendations
5	Diet	Specific foods to bind/eliminate toxins, high Zn foods. Detox strategies.
	Lifestyle	Oral hygiene, Epsom salt baths, GB exercises, movement
	Testing	None – working slowly to help recovery from covid
	Supps	Mg, Vit C, DHA, Fe, D-ribose, NAC
6	Diet	Gut repair nutrients, high Vit A foods, time-restricted eating (IF), colon cleanse, anti-fungals
	Lifestyle	EO steam inhalation, EFT tapping for detox, mindset health patterns
	Testing	Standard GP bloods, mould mycotoxins
	Supps	As plan 5 plus reintroduction of molybdenum, immune multi, S.boulardii and also L-glutamine, zeolite toxin binder



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Self-Reported Trial Scores

Reflect where Frances places herself on a scale of 1-10.

1 = very bad , 10 = very good.

Start of Trial		End of Trial	
Symptom	Score	Symptom	Score
Hearing loss (right ear)	1-4	Hearing loss (right ear)	8-9
Tinnitus	4	Tinnitus	10
Vertigo	2	Vertigo	10
Ear pressure/fullness	4	Ear pressure/fullness	10
Energy levels	4-5	Energy levels	8-9
Stress	4-5	Stress	8-9
Sleep	4-5	Sleep	9



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Frances Testimonial

Today, I'm living a relatively symptom free life , thanks to John Ingram from Deaf to Meniere's Charity for giving me this opportunity and introducing me to the amazing Jan.

Life was previously not good and doctors and meds weren't helping. But following Jan's guidance and taking her recommended supplements, I am enjoying life again. 6 months ago I spent most of my days in bed unable to do much but now I'm back to spinning classes (I even wear my noise cancelling head phones in the class as it's very loud).

I am feeling and living a happier healthier life and my MD symptoms are quiet .. sssshhh don't wake them I'm enjoying being me again.

Hope this inspires someone else to look for alternative help xx

Video Testimonial

<https://youtu.be/BAttrTufopc>



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3 Key Dietary Recs

- Hydration – increase fluids & electrolytes**
 - Fluids – 1.5 L p/d – average for sedentary person
 - Electrolytes – coconut water, pink Himalayan salt, celery, cucumber, watermelon, kiwi fruit, citrus fruits, pineapple, bell peppers, carrots
- Gluten – reduce or eliminate**
 - Gluten grains – wheat, rye, barley, oats
 - Non-gluten grains – rice, quinoa, buckwheat, millet, corn
 - Hidden gluten – beware! Often hidden in processed foods, tinned soups, sauces, etc. Read the labels.
- Rainbow diet – one food from each colour group p/d**
 - Colour groups – red | orange | yellow | green | blue, black, purple | white, tan, brown



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3 Key Lifestyle Recs

- Sunlight – get outdoors every day**
 - Vitamin D – 95% of your vitamin D comes from sunlight
 - Midday – best time for vitamin D creation in the skin
- Oral health – change your oral health routine**
 - Aloe vera products – toothpaste & mouthwash reduce inflammation & help rebalance oral microbiome
 - Dental problems – get infections & cavities addressed
 - Amalgam fillings – consider having them replaced
- Epsom salt baths – weekly routine**
 - Reduces stress – Epsom salts are magnesium sulphate
 - Skin detoxification – helps detox through the skin



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3 Key Supplements

- Magnesium – 300/400 mg/d
- Vitamin C – 1000 mg/d minimum
- Vitamin D – 1000 iu /25 mcg p/d

Good Professional Supplement Brands

- Viridian
- Cytoplan
- BioCare
- Pure Encapsulations

Professional Online Supplement Distributor
Natural Dispensary – 10% discount with code **JCL010**
<https://naturaldispensary.co.uk/>

NB: Medications – please check with your doctor before taking supplements



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3 Key Testing Recs

- GP Blood Tests**
 - Iron & ferritin, vitamins B12 & D, folic acid, alkaline phosphatase (*below 70 u/L indicates potential zinc deficiency*) electrolytes (sodium, potassium, bicarbonate, chloride), glucose/HbA1c
- Visual Sensitivity Contrast Test**
 - Very cheap online visual contrast test. Assesses for potential mould or other biotoxin illness (environmental toxins can affect vision).
 - <https://www.vctest.com/>
- Food Intolerance Test**
 - Cambridge Nutritional Sciences (CNS) – FoodPrint 40+
 - YorkTest – Premium Food Intolerance Test
 - Lifelab Testing – Basic (40) or Complete (159) Intolerance Tests



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Summary

Stress Key Points	Key Action Points
<ul style="list-style-type: none"> Increased Nutrient Requirements Reduced Digestion & Absorption Unhealthy Eating Patterns Breakdown Rate Exceeds Repair Rate 	<ul style="list-style-type: none"> Change your diet Consult an expert Address your lifestyle Consider basic tests



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Boundless Energy Services

Programme	Phase	Specifics
Foundational Refresh (3 mths)	Energising Strengthening & rebalancing	Nutrients – hydration, proteins, carbs, fats Systems – digestion, absorption, BS balance Lifestyle – body clock, sleep, chem toxins Elimination – (gentle) gut, kidneys, liver Ad hoc – movement, stress, mindset
Standard Revive (6 mths)	Pt 1 – Energising Pt 2 – Cleansing Detox, repair, renewal	Nutrients – phytonutrients, specific foods Systems – anti-inflamm, detox, repair/renewal Lifestyle – lymphatics, EMFs, grounding Elimination - (stronger) gut, kidneys, liver Ad hoc – movement, stress, mindset

Structure

- 1 x online consultation p/m – 90 mins first one, 60 mins thereafter
- Fortnightly email follow-ups/checking in & plan adjustments where necessary
- Unlimited email support & health coaching to overcome obstacles
- Personalised monthly health plans covering diet, supplements, lifestyle, testing

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Boundless Energy Prices

10% Discount For Masterclass With Code: Masterclass10

Programme	Full Payment (Discounted)	Monthly Instalments
Refresh (3 mths)	£454	£158
Revive (6 mths)	£855	£149

Next Step

Book a 30 minutes FREE Discovery Call from my website online booking system

<https://www.boundless-energy.co.uk/book-online>

NB: Calls outside of the UK will be via Zoom

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Feedback

We would love to hear your thoughts on how you found this Masterclass and we will send out a very short feedback form after the event

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