



IPM CONGRESS 2026 · LONDON · FUTURE OF MEDICINE

Using Functional Nutritional Testing to Personalise Healthcare

and Shape the Future of Medicine in Clinical Practice

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Agenda

01 The Nutrient Crisis

The scale and impact of nutrient insufficiency hiding in plain sight

02 Nutrient Deficiency & Disease

Chronic conditions that nutrient gaps may drive over time

03 The Testing Gap

Why standard bloods often don't catch subclinical insufficiency

04 NutrEval nutritional testing

5 functional pillars and how the test works

05 Understanding the Report

Walking through key markers, patterns and clinical implications

06 Clinical Application

Turning results into a personalised, evidence-based approach



2.4 Billion People

globally fail to meet minimum recommended magnesium intake alone

And magnesium is just one of over 40 essential nutrients the body cannot function without.
Nutrient insufficiency is often one of the lesser considered drivers of chronic disease.

Lancet Global Health (2024); International Journal of Vitamins and Nutrition Research (2024)



SECTION 1 · THE NUTRIENT CRISIS

How Widespread Is Nutrient Insufficiency?

49.5%

of UK adults have suboptimal vitamin D (< 75 nmol/L)

8.2%

of UK men have zinc intakes below the LRNI (vs 5.2% of women)

50.3%

of UK women have selenium intakes below safe threshold

12.6%

of UK women have inadequate riboflavin B2 (vs 4% of men)

1 in 4

UK women have potassium intakes below the recommended level

83%

of UK women (16–49) have inadequate folate status

Sources: ForthWithLife (2024–25); NDNS 2019–23 (DHSC/UKHSA); IJVNR (2024); Derbyshire, Front. Nutr. 2018



Insufficiency vs Deficiency

Optimal	Subclinical Insufficiency	Frank Deficiency
Optimal Function All biochemical pathways running efficiently. No or very few symptoms. Disease risk low.	Standard tests often miss this Most labs appear 'normal' yet cellular function is already impaired. Fatigue, brain fog, low mood, poor recovery. Symptoms sometimes be vague.	Clinically detectable Serum deficiency visible in standard bloods. Significant symptoms. Disease risk elevated. Intervention harder and slower.

Functional testing identifies insufficiency BEFORE it becomes deficiency — the critical advantage over standard testing.



When Nutrient Gaps Go Unaddressed

Oxidative Stress

Association: cardiovascular disease, cancer, Alzheimer's and Parkinson's disease, chronic systemic inflammation and accelerated biological ageing

Mitochondrial Function

Association: CFS, fibromyalgia, heart failure, Parkinson's disease, Type 2 Diabetes and neurodegeneration

Omega Imbalance

Association: depression, ADHD, cardiovascular disease, rheumatoid arthritis, IBD and cognitive decline via pro-inflammatory omega-6 dominance

Toxic Exposure

Association: cancer, neurological damage, kidney and liver disease, hormonal disruption and immune dysfunction from accumulated toxic burden

Methylation Imbalance

Association: cardiovascular disease (elevated homocysteine), depression, Alzheimer's disease, elevated cancer risk and autoimmune conditions

Antioxidant Insufficiency

Association: immune dysfunction, recurrent infections, oxidative tissue damage, impaired wound healing and increased cancer susceptibility

Sources: *Nutrients* (2023, 2024), *PMC - Role of Nutrition in Chronic Disease* (2023), *Role of Nutrition in Neurological Disorders* (2023)



SECTION 2 • NUTRIENT DEFICIENCY & DISEASE

Early Identification Changes Outcomes

The Conventional Pathway

1. Patient/client presents with vague symptoms
2. Standard bloods run — often 'normal range'
3. Symptoms may be managed with medication(s)
4. Subclinical insufficiency continues
5. Tissue damage accumulates over years
6. Disease diagnosis – treatment plan initiated

VS

The Functional Pathway

1. Patient/client presents with vague symptoms
2. NutrEval test initiated
3. Subclinical gaps identified
4. Personalised nutritional approach initiated
5. Biochemistry addressed appropriately
6. Balance restored



SECTION 3 · THE TESTING GAP

Standard Blood Testing Often Misses The Broader Picture

Standard serum levels tell you what's in the blood rather than how well nutrient are being utilised inside the cell.

Static Snapshots

Serum levels fluctuate with diet, hydration and stress. A single measurement can appear 'normal' even when cellular stores are depleted.

Narrow Reference Ranges

Standard reference ranges are designed to avoid overt deficiency and not to achieve optimal cellular function.

Missing Functional Markers

Standard panels don't test organic acids, amino acids, fatty acids, oxidative stress or mitochondrial markers or how well nutrients are being utilised.

No Interplay Analysis

Nutrients work synergistically. Magnesium deficiency impairs B6 activation; B2 deficiency impairs MTHFR reducing active folate and B12 in methylation. Standard testing cannot identify these interactions.



NutrEval FMV

Comprehensive Profile for
Identifying Nutritional
Deficiencies and
Insufficiencies

125+

individual biomarkers

5

functional imbalance pillars

2

sample types (blood + urine)

40+

nutrients assessed functionally

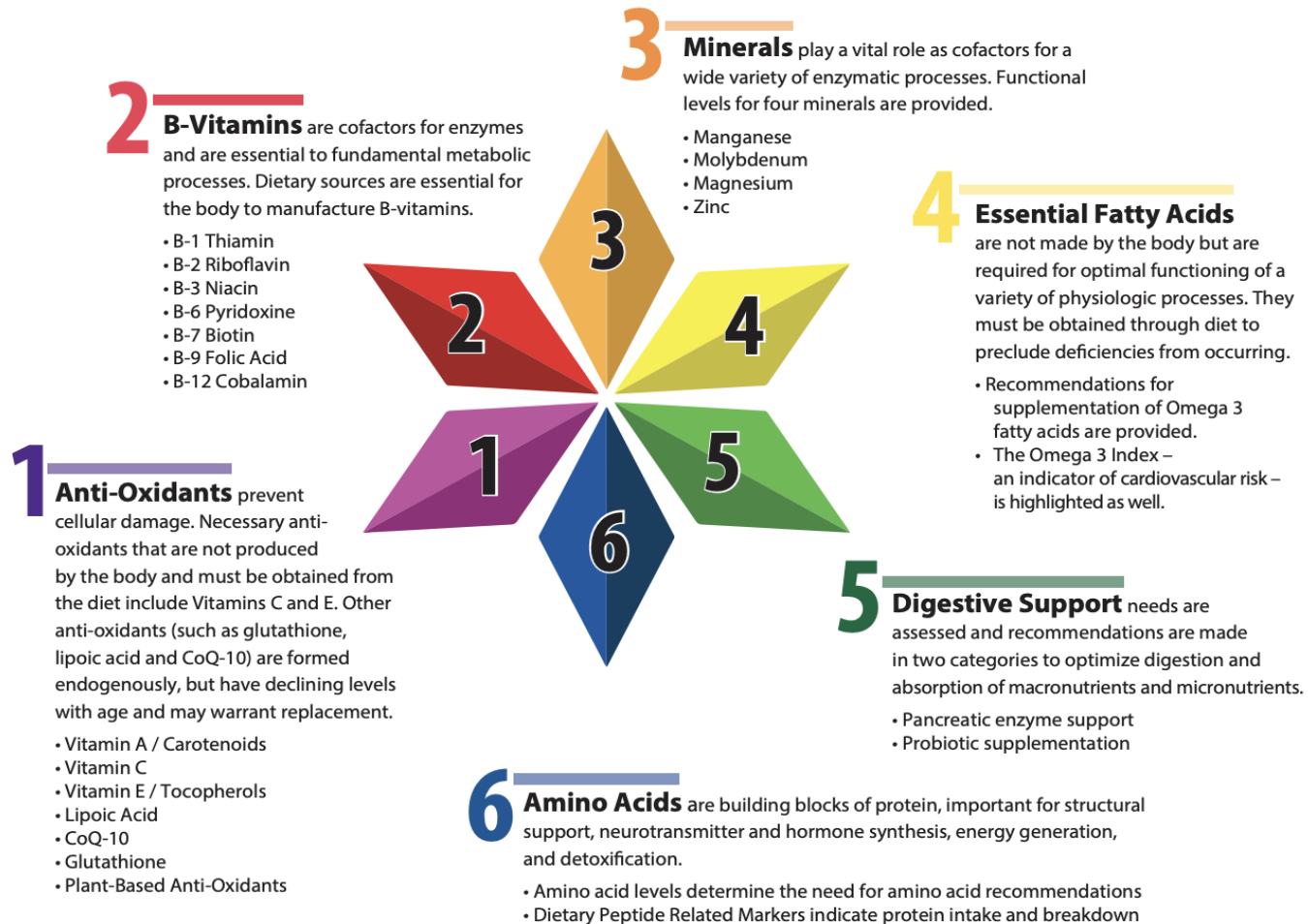


SECTION 4 • NUTREVAL

The **NutrEval** helps clinicians **identify cellular mechanisms and imbalances** which may lead to the development of **chronic diseases**. Assessing specific **biomarkers, pathways and patterns** provides a more comprehensive and accurate functional assessment.



SECTION 4 • NUTREVAL





SECTION 4 · NUTREVAL

What Does the NutrEval Measure?

Organic Acids

Metabolic pathway markers revealing mitochondrial function, B vitamin utilisation, neurotransmitter metabolism and gut microbial activity

Oxidative Stress Markers

Antioxidant sufficiency and oxidative stress markers. Glutathione, CoQ10, vitamins A, C and E, and plant-based antioxidant intake

Amino Acids

Protein metabolism, neurotransmitter precursors, detoxification capacity and essential building blocks for enzyme and hormone production

Essential & Metabolic Fatty Acids

Omega-3 Index, Omega 3:6 balance, cell membrane integrity, cardiovascular and brain health, a range of other fatty acids including EPA, DHA, Omega-7 and -9, trans fats, saturated fats

Toxic & Nutrient Elements

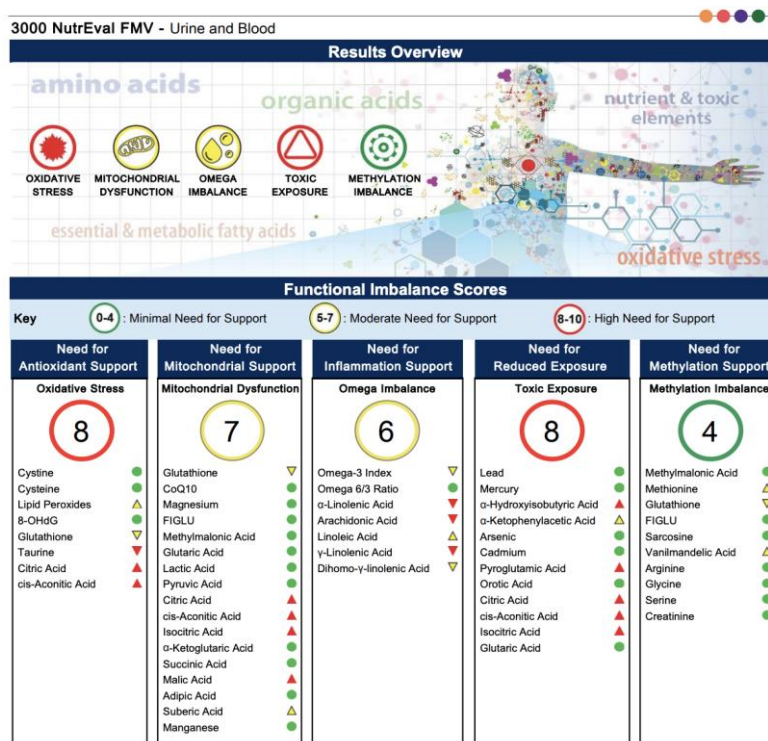
Heavy metal exposure and burden (mercury, lead, arsenic) alongside essential mineral status (zinc, magnesium, selenium) - critical for detoxification and overall function

Functional Imbalance Scores

Each pillar integrates multiple related biomarkers into a single functional imbalance score (1–10). Scores ≥ 5 indicate moderate to high support needed; < 5 suggests low need.

Functional imbalance scores highlight key areas of potential dysfunction

Algorithm-derived scores based on the clinical significance of specific biomarkers



Green circle denotes within reference range; yellow triangle in RR but high or low; red triangle outside of RR)

Biomarkers, organic acids, amino acids, essential fatty acids all provide insight into overall balance



Assessment of overall need for support

Oxidative Stress	Mitochondrial Dysfunction	Omega Imbalance	Toxic Exposure	Methylation Imbalance
Need for Antioxidant Support	Need for Mitochondrial Support	Need for Inflammation Support	Need for Reduced Exposure	Need for Methylation Support
Oxidative Stress 8 - Cystine ● - Cysteine ● - Lipid Peroxides ▲ 8-OHdG ● - Glutathione ▼ - Taurine ▼ - Citric Acid ▲ - cis-Aconitic Acid ▲	Mitochondrial Dysfunction 7 - Glutathione ▼ - CoQ10 ● - Magnesium ● - FIGLU ● - Methylmalonic Acid ● - Glutaric Acid ● - Lactic Acid ● - Pyruvic Acid ● - Citric Acid ▲ - cis-Aconitic Acid ▲ - Isocitric Acid ▲ - α-Ketoglutaric Acid ● - Succinic Acid ● - Malic Acid ▲ - Adipic Acid ● - Suberic Acid ▲ - Manganese ●	Omega Imbalance 6 - Omega-3 Index ▼ - Omega 6/3 Ratio ● - α-Linolenic Acid ▼ - Arachidonic Acid ▼ - Linoleic Acid ▲ - γ-Linolenic Acid ▼ - Dihomo-γ-linolenic Acid ▼	Toxic Exposure 8 - Lead ● - Mercury ● - α-Hydroxyisobutyric Acid ▲ - α-Ketophenylacetic Acid ▲ - Arsenic ● - Cadmium ● - Pyroglutamic Acid ▲ - Orotic Acid ● - Citric Acid ▲ - cis-Aconitic Acid ▲ - Isocitric Acid ▲ - Glutaric Acid ●	Methylation Imbalance 4 - Methylmalonic Acid ● - Methionine ▲ - Glutathione ▼ - FIGLU ● - Sarcosine ● - Vanilmandelic Acid ▲ - Arginine ● - Glycine ● - Serine ● - Creatinine ●

Nutrient Needs Calculated

Algorithm-derived
nutrient needs based
on results. Dose
recommendations

Antioxidants, B-vitamins,
Minerals, EFAs, GI
Support, Amino Acids,
Vitamin D, Homocysteine

Need for Amino Acids are
highlighted toward the
bottom of the page. Dose
recommendation also
provided

Nutrient Need Overview												DRI	Suggested Recommendations	Provider Recommendations
Nutrient Need														
	0	1	2	3	4	5	6	7	8	9	10			
Antioxidants														
Vitamin A												3,000 IU	5,000 IU	
Vitamin C												90 mg	500 mg	
Vitamin E / Tocopherols												22 IU	200 IU	
α-Lipoic Acid													200 mg	
CoQ10													30 mg	
Glutathione														
Plant-based Antioxidants														
B-Vitamins														
Thiamin - B1												1.2 mg	25 mg	
Riboflavin - B2												1.3 mg	10 mg	
Niacin - B3												16 mg	30 mg	
Pyridoxine - B6												1.7 mg	25 mg	
Biotin - B7												30 mcg	100 mcg	
Folate - B9												400 mcg	400 mcg	
Cobalamin - B12												2.4 mcg	100 mcg	
Minerals														
Magnesium												420 mg	800 mg	
Manganese												2.3 mg	5.0 mg	
Molybdenum												45 mcg	75 mcg	
Zinc												11 mg	10 mg	
Essential Fatty Acids														
Omega-3 Fatty Acids												500 mg	1,000 mg	
GI Support														
Digestive Support/Enzymes													5,000 IU	
Microbiome Support/Probiotics													25 billion CFU	
Vitamin D														
Vitamin D												600 IU	1,000 IU	
Amino Acids (mg/day)														
Arginine	0		Methionine		0		Recommendations for age and gender-specific supplementation are set by comparing levels of nutrient functional need to optimal levels as described in the peer-reviewed literature. They are provided as guidance for short-term support of nutritional deficiencies only. The Nutrient Need Overview is provided at the request of the ordering practitioner. Any application of it as a therapeutic intervention is to be determined by the ordering practitioner.							
Asparagine	0		Phenylalanine		0									
Cysteine	0		Serine		0									
Glutamine	0		Taurine		1,011									
Glycine	3		Threonine		0									
Histidine	0		Tryptophan		0									
Isoleucine	0		Tyrosine		0									
Leucine	0		Valine		0									
Lysine	0													



Oxidative Stress & Antioxidant Capacity

HIGH NEED FOR SUPPORT — Multiple antioxidant systems under significant pressure in this sample patient

Key Biomarkers

Lipid Peroxides

Oxidative damage to cell membrane lipids

8-OHdG

Oxidative damage DNA marker

Pyroglutamic Acid

Glutathione depletion indicator

Glutathione

Redox balance

Cysteine

Glutathione precursor amino acid

Taurine

Indicator of increased oxidative stress

α -Hydroxybutyric Acid

Marker for oxidative stress

Clinical Support



Vitamins A, C, E

Antioxidant vitamins — oxidative defence nutrients



α -Lipoic Acid

Regenerates glutathione; protects mitochondria



CoQ10 (serum)

Mitochondrial energy and cardiac function



Glutathione

Master antioxidant; detox and immune function



Plant-based Antioxidants

Polyphenols, carotenoids, EGCG — dietary defence

Mitochondrial Dysfunction

MODERATE NEED FOR SUPPORT — Imbalances may impair overall mitochondrial function and ATP production

Key Biomarkers

Fatty Acid Oxidation

Adipic acid, Suberic acid - beta-oxidation markers

Carbohydrate Metabolism

Pyruvic acid, Lactic acid - glycolytic pathway markers

Citric Acid Cycle

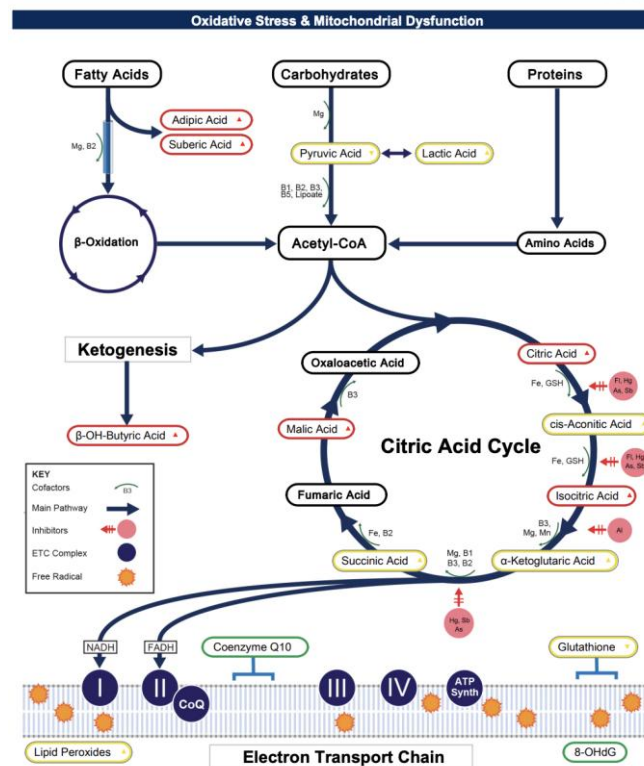
Citric, cis-aconitic, isocitric, succinic and malic acids

α -Ketoglutaric Acid

Krebs cycle and amino acid metabolism interface

β -OH-Butyric Acid

Ketogenesis and fatty acid utilisation marker





Inflammation / Omega Imbalance

MODERATE NEED FOR SUPPORT — Primarily through supporting Omega-3 Index

Key Biomarkers

Omega-3 Index

EPA + DHA (4.7% test result)
8–10% optimal cardiovascular and anti-inflammatory protection

Omega-6/3 Ratio

Balance is key: standard Western diet averages 15:1 - more pro-inflammatory

Trans Fats

If Elaidic acid detected - industrial trans fat. Strongly linked to CVD, inflammation and insulin resistance

EPA (20:5 n3)

Key regulator of inflammation; cardiovascular protection; mood regulation and immune modulation

DHA (22:6 n3)

Critical for brain neuron health, vision, neuroprotection and foetal development

Omega-7 & -9

Omega-7 supports metabolic health; omega-9 (oleic acid) - cardiovascular and anti-inflammatory benefits

Saturated Fats

Elevated intake linked to cardiovascular risk and insulin resistance - quality and source are key factors in clinical assessment

Delta-6 Desaturase Activity

Rate-limiting enzyme for omega-3 and omega-6 conversion



Toxic Exposure

HIGH NEED FOR SUPPORT — Increased oxidative stress and reduced capacity for detoxification

Key Biomarkers

α -Hydroxyisobutyric Acid

MTBE — petrol/fuel additive exposure marker

α -Ketophenylacetic Acid

Styrene — plastic and food packaging exposure

Pyroglutamic Acid

Indicator of impaired production and recycling of glutathione

Orotic Acid

Urea cycle stress and impaired liver detoxification

Citric / Cis-aconitic / Isocitric Acids

Krebs cycle backup — heavy metal inhibition of aconitase

Glutaric Acid

Riboflavin depletion associated with toxic burden

Clinical Support

Glutathione Support

Including precursor and/or nutrient cofactor support

Liver Support

Support Phase I and II detoxification pathways

Antioxidant Support

Reduce oxidative burden from toxic exposures

Filter Drinking Water

Remove chlorine, heavy metals and chemical contaminants at source

Avoid Plastic Containers

Reduce ongoing styrene and MTBE exposure from food and drink packaging



Methylation Imbalance

LOW NEED FOR SUPPORT — Methylation is a critical process; ongoing monitoring recommended

Key Biomarkers

MMA (Methylmalonic Acid)

B12 functional need indicator

FIGLU

Folate functional need indicator

Homocysteine (only on NutrEval)

Key cardiovascular and methylation marker

Methionine

SAMe precursor; mood, detox and epigenetics

B6 (Pyridoxine)

Neurotransmitter synthesis and transsulfuration

Catecholamine Metabolites

Dopamine/adrenaline breakdown — methylation marker

Clinical Support

Methylated B Vitamins

Methylfolate (B9), methylcobalamin (B12) and P5P (B6) to directly support methylation pathways

Reduce Homocysteine

Targeted B6, B9 and B12 combination lowers elevated homocysteine and cardiovascular risk

Methyl Donors

Betaine (TMG) supports SAMe production and methylation capacity

Dietary Support

Leafy greens, eggs, legumes and brassicas to provide natural folate and methyl-group donors

Lifestyle

Reduce alcohol and smoking - both deplete B vitamins and significantly impair methylation



THE FUTURE OF MEDICINE

Functional Nutritional Testing is the Future of Clinical Practice

Precision and personalisation

Blanket approach to supplementation is often ineffective.
Every patient's metabolic terrain is unique

Prevention over Prescription

Identifying and correcting nutritional biochemistry has the potential to prevent chronic disease and reduce reliance on medication

Root Cause over Symptom Management

Nutrient insufficiency drives inflammation, oxidative stress and mitochondrial dysfunction. Address the imbalances

Measurable & Repeatable

Re-testing at around 3–6 months where possible provides the option of monitoring and tracking improvements



SUMMARY

Key Takeaways

1

Nutrient insufficiencies and deficiencies impact function

Often go unnoticed and present as unexplained symptoms. Subtle changes that progress over time; often worsening

2

Insufficiency drives chronic disease

Nutrient gaps silently underpin cardiovascular disease, neurological decline, metabolic disorders and mitochondrial dysfunction

3

Nutritional testing goes beyond standard bloods

125+ biomarkers measuring FUNCTION - organic acids, fatty acids, amino acids, oxidative stress and toxic exposure

4

5 pillars guide clinical prioritisation

Functional imbalance scores for oxidative stress, mitochondrial function, omega balance, methylation and toxic exposure

5

Precision nutrition, evidence-based approach made easy

Individualised results - enables a systems-based approach to precision, personalised patient/client care



SUMMARY

Connect with Genova Diagnostics

1	Website	www.gdx.net
2	Email	clineduk@gdx.net / info@gdx.net
3	Practitioner login	MyGDX (for account holders)
4	Phone	+44 (0) 20 8336 7750
5	Education	The Lab Report Podcast, Learning Library, Webinars, Group Training, 1:1



Questions?

Erica Hart · Clinician Educator

IPM Congress 2026 · London

Thank you for attending today's workshop