

FUNCTIONAL MEDICINE & CHIROPRACTIC LECTURE SERIES

GEORGIA CHIROPRACTIC ASSOCIATION (2025)

Presenter: Dr. Brandon M Lundell, DC, APC, DABCI, IFMCP, DAACA, NE, CAC

PART 2: Date: October – Atlanta (8 hours)

Title1 : How the Gut Influences Health and Disease – From Autoimmune to Alzheimer's, Treating the Gut Saves Lives.

Title 2: Biochemistry in Practice, Part 2. Gut- Human Health Matrix. Solving Autoimmune, Insulin Resistance and Cardio-Vascular Disease by Focusing on Gut Health

Title 3: Functional Medicine Practice Accelerator: Gut-Health Connection. Laboratory Evaluations and Treatments for GI, Autoimmune and Neurological Deficits

Theme: GI Dysregulation as a Driver of Chronic Disease

Target: Functional medicine and integrative physicians seeking advanced, systems-based clinical mastery

Hour 1: The Gut-Human Health Matrix Overview

- Systems interconnected via the gut:
 - Brain (neurotransmitters, vagus, cytokines)
 - Mitochondria (SCFA signaling, ROS modulation)
 - Immune system (GALT, inflammasome, leaky gut)
 - Epigenome (MDCs, nutrient signaling, SCFA regulation)
 - Structural system (connective tissue degradation via LPS, zonulin)

Hour 2: Leaky Gut and Autoimmunity: Mechanisms and Early Identification

- Pathophysiology of tight junction breakdown:
 - ZO-1, occludin, claudins
 - Zonulin-mediated permeability and LPS translocation
- Dysbiosis and cytokine profile shifts (Th17/Treg balance)
- Diagnostic markers:
 - Serum zonulin, LPS, CD14, calprotectin, beta-glucuronidase

- Conditions associated with intestinal permeability:
 - RA, MS, ankylosing spondylitis, autoimmune hepatitis

Hour 3: Leaky Gut and Type 1 Diabetes

- Gut barrier dysfunction in early T1D development
- Evidence for dysbiosis and loss of oral tolerance preceding pancreatic autoimmunity
- Zonulin upregulation in preclinical and clinical T1D
- Lactulose/mannitol testing in risk identification
- Therapeutic strategies:
 - Butyrate, indole-3-propionic acid, larazotide acetate
 - SCFA restoration, polyphenols, mucosal repair nutrients (glutamine, zinc carnosine)

Hour 4: Leaky Gut and Type 2 Diabetes: Inflammation, Insulin, and Mitochondria

- Role of gut-derived LPS in insulin resistance
- Low-grade endotoxemia and its metabolic consequences
- Dysbiosis-induced suppression of SCFAs and mitochondrial damage
- Cross-talk between insulin signaling, mitochondria, and gut barrier
- Treatment applications:
 - Berberine, ALA, NAC, curcumin for redox/inflammation
 - Microbiota restoration and bile acid signaling (FXR, TGR5 modulation)

Hour 5: The Microbiota-Mitochondria Axis

- SCFAs as signaling molecules and mitochondrial fuels
- Gut-derived antioxidants and mitochondrial repair
- Butyrate's role in gene expression (HDAC inhibition, HIF-1 α stabilization)
- Implications for neurodegeneration, chronic fatigue, and chronic pain
- Clinical interventions:
 - Fiber diversity, resistant starch, prebiotic supplementation

- Mitochondrial cofactors with microbiome synergy

Hour 6: Gut-Joint Axis and Structural Implications

- Gut-derived inflammation and its role in joint degeneration
- Molecular mimicry and microbial antigen-driven autoimmunity
- Links between dysbiosis, zonulin, and synovial inflammation
- Relevant conditions: RA, ankylosing spondylitis, reactive arthritis
- Treatment approaches:
 - SCFA and barrier repair strategies
 - Targeted anti-inflammatory nutrition and microbiota modulation
 - Structural rehab integration (chiropractic, manual therapy, movement)

Hour 7: GLP-1 Agonists, the Microbiome, and Functional Alternatives

- Mechanism of GLP-1 agonists (e.g., Ozempic) and gut-brain-pancreas signaling
- Impact on microbiota diversity and transit time
- GI-related side effects and mitochondrial concerns
- Functional mimicry and alternatives:
 - Berberine, inositol, taurine, magnesium, lifestyle-driven GLP-1 stimulation
- Microbiota considerations in long-term GLP-1 use

Hour 8: Case Study: Tim A. – Autoimmunity Behind Misdiagnosed Hip Pain

- Patient profile and history
- Clinical misdiagnosis as orthopedic pain
- Functional assessment: labs, GI biomarkers, systemic inflammation
- Gut-immune findings pointing to autoimmune etiology
- Multiphase therapeutic plan:
 - Gut repair and microbiome balancing
 - Inflammation resolution and mitochondrial repletion
 - Structural and neurological rehabilitation
- Long-term outcomes and clinical takeaways

