



XXIX IFSO World Congress

1-4 September 2026 | Toronto, Canada

Guarding the Micronutrient Gap

Sept 2, 14:00-15:30

TORONTO2026

**The Future of Obesity Management:
From Weight Loss to Health Gain**



ifso2026.org

- +
 - Guarding the Micronutrient Gap: Obesity Management Medications (OMM) and MBS Beyond The Lab: Rapid Recognition and Treatment of Micronutrient Deficiencies

Julie Parrott, PhD, MS, RDN

Sept 2, 14:00-15:30



Disclosure Slide

☐	No, nothing to disclose
☒	Yes, please specify:

Company Name	Honoraria/ Expenses	Consulting/ Advisory Board	Funded Research	Royalties/ Patent	Stock Options	Ownership / Equity Position	Employee	Other (please specify)
Various attorneys case review as expert witness for nutrition-related malpractice								



Roadmap

1. Mechanisms – How OMM and MBS change quantity, variety, absorption and nutrient loss.
2. Recognition Gap – Why symptoms may appear before a complete or timely biochemical (lab) evaluation.
3. Triage – Micronutrient deficiencies: brewing vs urgent
4. How does the multidisciplinary team (MDT) fit in?



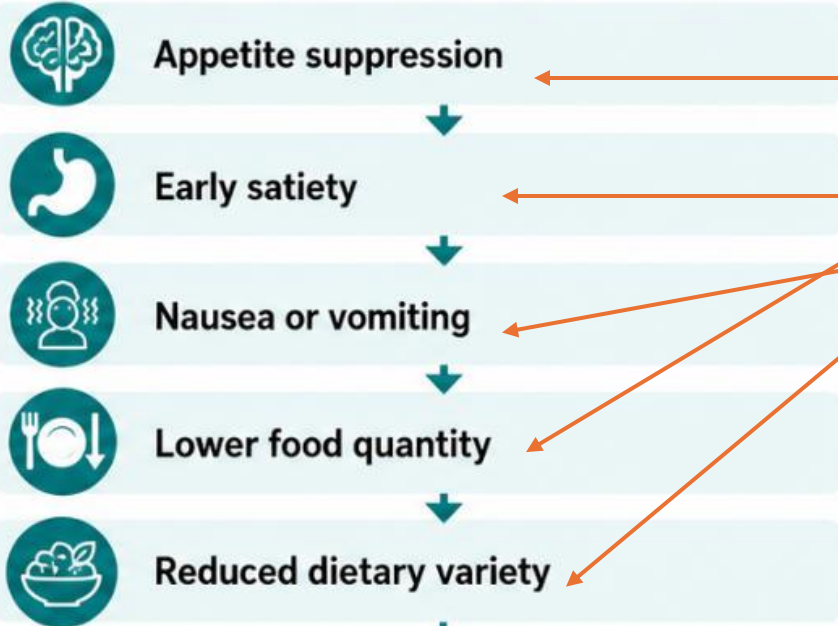


Mechanisms – How OMM and MBS change quantity, variety, absorption and nutrient loss.



OMM vs MBS: How Nutrient Risk Develops

OMM / Incretin Therapy

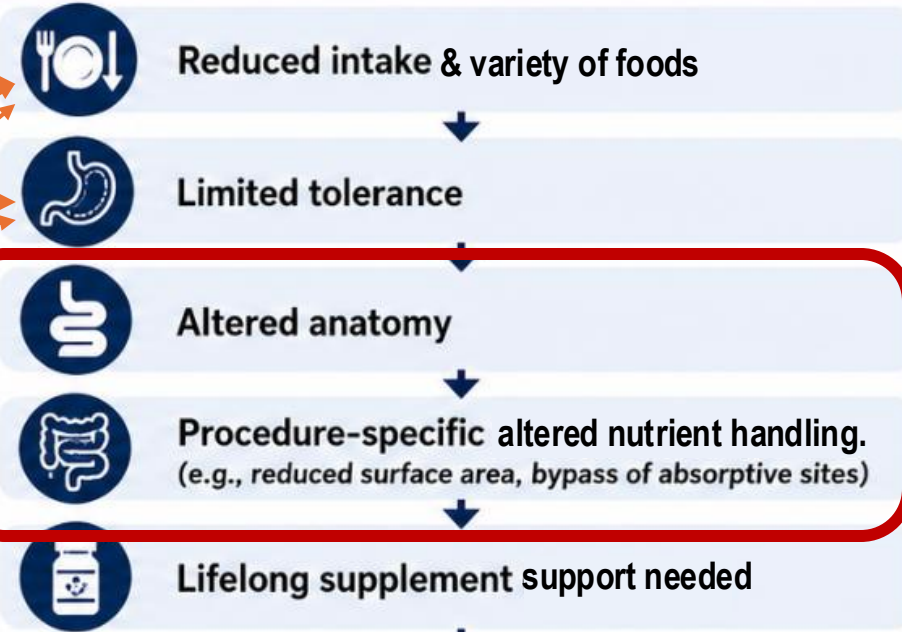


MICRONUTRIENT RISK



Primary pathway: Reduced intake and tolerance.
Not a classic malabsorption process.

MBS



MICRONUTRIENT RISK



Multifactorial pathway: Intake limitation +
anatomy-driven hypoabsorption.



Both pathways can expose and exacerbate **PRE-EXISTING DEFICIENCY.**

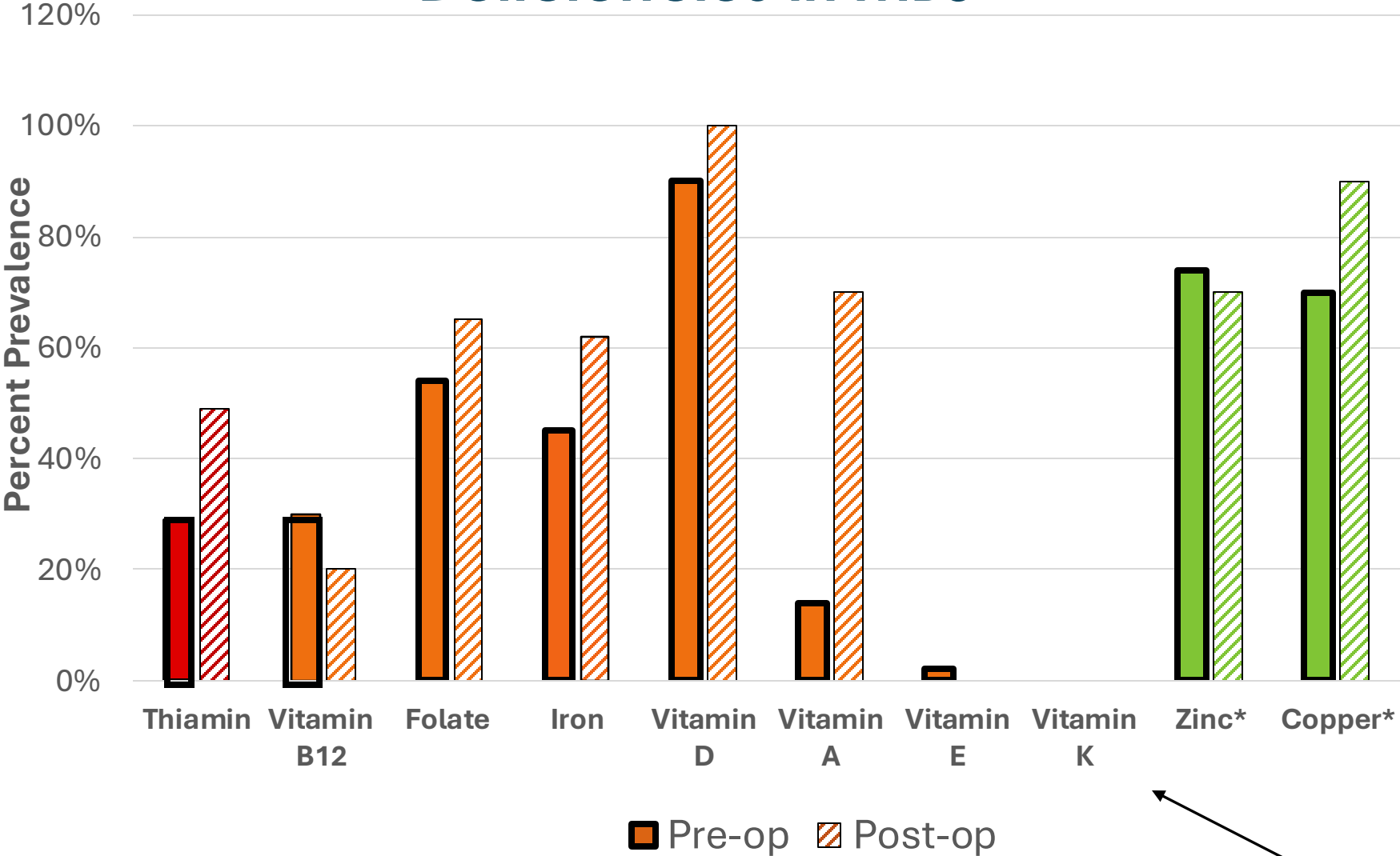
Nutrient risk exists before MBS/ OMM

Baseline status matters

- Most patients with obesity begin treatment with one or more nutrient deficiency – see graph on next slide
- Thus, OMM and MBS often expose or amplify vulnerability rather than create it from zero.
- Evidence: Nutrient deficiencies are reported in pre-op pts – see graph.



Reported Upper Levels of Micronutrient Deficiencies in MBS



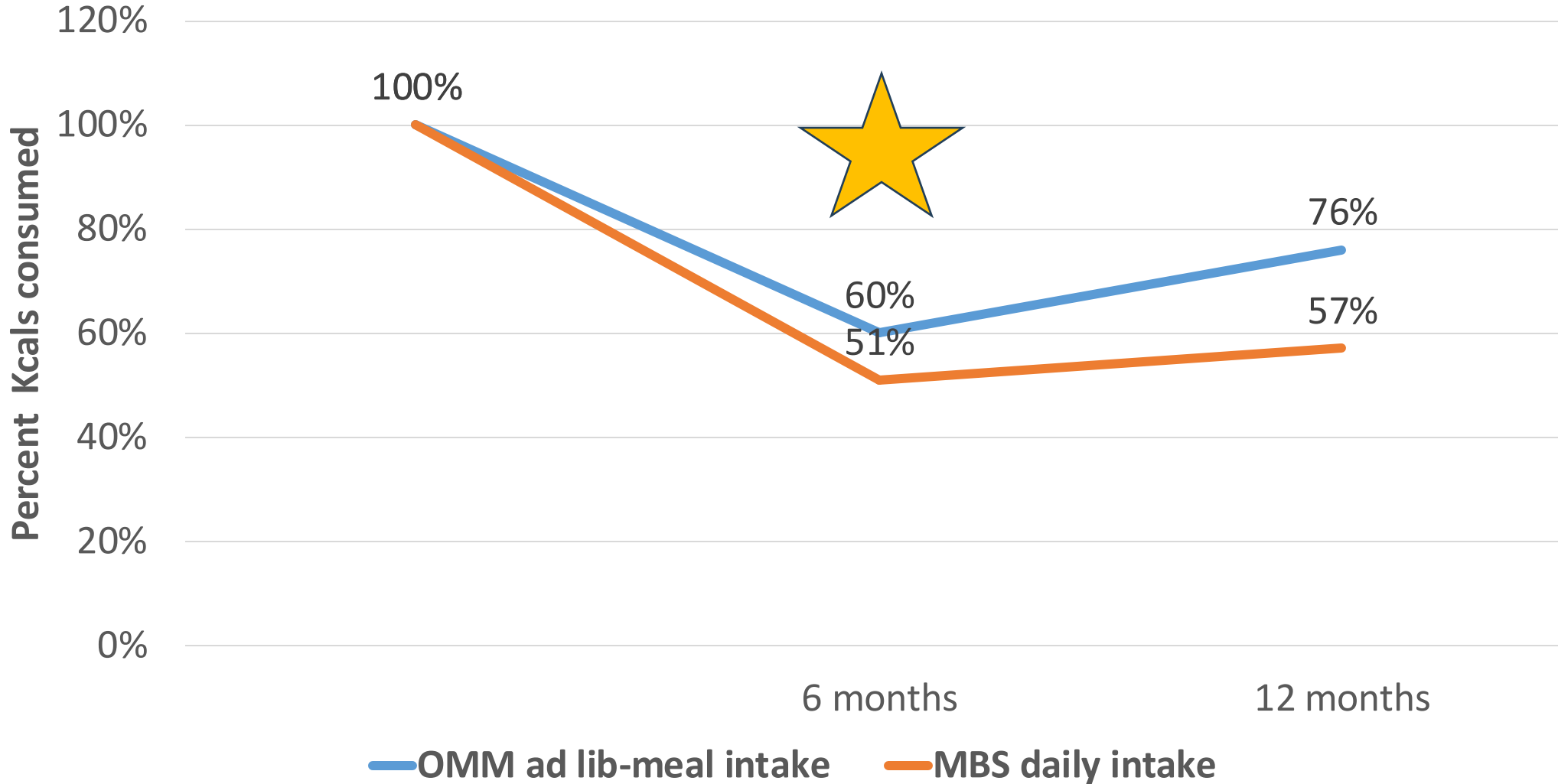
Red = permanent & irreversible damage

Orange = serious harm

Green = patients seeking BPD/DS

No data on Vit K

Comparison of Reduced Energy Intake



Clinical Implication

Risk after MBS and OMM:

- 1. Baseline obesity related micronutrient deficiency vulnerability
- 2. Reduced food volume / calories
- 3. Food –quality and tolerance changes
- 4. Creates increased risk of micronutrient deficiencies

OMM ~ 1200 kcals
(~40% ↓kcals)

Energy level	Typical designation	Micronutrient implication
<800 kcal/day	Very-low-calorie diet (VLCD)	High risk without a medically formulated meal-replacement plan and prescribed vitamin/mineral supplementation.
1,000–1,500 kcal/day	Low-calorie diet (LCD)	Nutrient adequacy is possible but requires deliberate food selection; calcium, iron, magnesium, potassium, vitamin D, folate, and fiber are common pressure points.
1,200–1,500 kcal/day	Common clinical weight-loss range	Usually needs nutrition planning and often a multivitamin/mineral, tailored to the individual and treatment context.

A low reported intake signals higher risk, prompting preventive nutrition planning, including a daily multivitamin/mineral supplement, particularly with low intake and/ or limited variety.

Reported Micronutrient Deficiencies after OMM

Less food, less variety = less opportunity to meet micronutrient needs.

- Review of 10 studies: kcal intake ↓ by 16-39% (Christensen, et al., 2024)

Can't meet ind. needs: OMM users frequently fail to meet requirements for:

- calcium, iron, zinc and vitamins A, D, E, K, B1, B12 and C. (Sibal, 2025)

New micronutrient deficiencies: GLP-1 RA treated adults (n=461,382)

- 6 months post-OMM: 12.7% pts
- 12 months post-OMM: 22.4% pts
- Highest prevalence post-OMM: vitamin D, next: **vitamin B1 (thiamine)** (Butsch, 2025)

OMM alters intake and output, driving the need for a daily multivitamin



Patients at Risk for Micronutrient Deficiencies

OMM

- Very low energy intake, particularly < 1200 kcals for women and < 1800 kcal for men
- Post-MBS or other condition with impaired intake or absorption

Patients with:

- **GI issues:** pre-existing gastroparesis, motility disorders, or dyspepsia
- **Increased needs:** CKD, CHF, dehydration
 - Cancer with elevated protein and energy needs and suppressed appetite
 - Medications: opioids, anticholinergics and/or diuretics
- Current or past history of eating disorders

MBS

- Females
- Patients not attending a nutritional clinic after surgery

Patients with:

- Low SES
- **GI symptoms** (intractable nausea and vomiting, jejunal dilation, mega-colon, or constipation)
- **Concomitant medical conditions** such as cardiac failure (especially those receiving furosemide)
- Small bowel bacterial overgrowth (SBO)



Is a multivitamin needed for OMM like MBS?

Coverage

- They provide broad *preventive* coverage when intake is low, variable, or unreliable.

This is not a “wait and see”. A daily multivitamin is essential!!

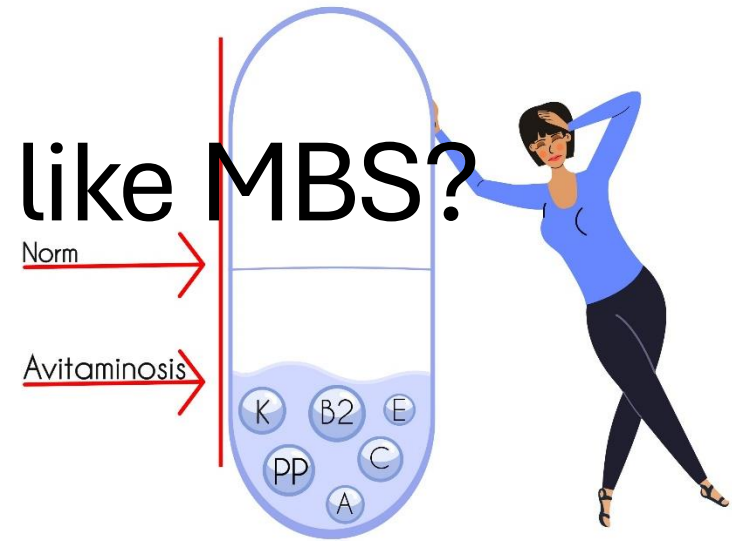
Guideline/consensus basis

• MBS:

- ASMBS guidance specifically addresses B1, B12, folate, iron, calcium, vitamin D, zinc, copper, and fat-soluble vitamins for MBS.

• OMM:

- Almondoz, et al., 2024 “consider a multivitamin...”
- Giglotti, et al., 2025 “consider a multivitamin/mineral supplement if nutrient intake is inadequate...”
- Mozaffarian, et al., 2025 (Joint statement): “multivitamin may be needed”.



A necessity when intake is low, variable, or unreliable

Patients are **unable** to “food their way out” of risk once intake falls or anatomy/nutrient handling is altered.



Recognition gap - Why symptoms often surface before a full set or timely biochemical (lab) workup.



Signs & Symptoms?

- It is taught that lab testing often detects deficiency first,
- but symptoms can appear *before*—or *despite*—a normal lab test



Type	What it means	Nutrient-related examples
Symptom	Something you feel or notice	Fatigue, brain fog, muscle cramps, tingling, nausea, poor appetite
Sign	Something a clinician—or a test—can detect (observe or measure)	Poor reflexes, low hemoglobin, ferritin or 25-hydroxyvitamin D



The recognition gap: symptoms speak before labs

Why labs are not flawless

- Monitoring may be incomplete, delayed, non-targeted, or absent.
- Reference ranges for labs may not capture early functional decline/ ranges don't reflect the normal curve for a patient with obesity
- Symptoms may arise before the “right” test is ordered

Why symptoms matter

- Fatigue, hair loss, paresthesia, glossitis, bruising, edema, weakness, poor wound healing, and gait changes are early clues. (Mozaffarian, et al., 2025)
- Persistent vomiting or rapid decline should immediately raise urgency.



Ask probing questions:

Vitamin C:

- Do you see blood in the sink when you brush your teeth?
- Frequent nosebleeds or heavy menses?
- Teeth loss or unusual dental work?

Vitamin B1:

- More forgetful or confused?
- Off-balance, feel as if you are going to fall?
- Tingling, pricking or numbness in hands/feet?

Patients don't show & tell, because they typically don't know what is relevant/ a symptom





Triage – Simmer vs urgent!!



~ Physical Reserve Timeframe

Days to weeks / very limited reserves

Weeks to months

Months to years

1–2 years

2–5 years

Indefinite / very large structural pool

Nutrients

Vitamin C; thiamin (B1); riboflavin (B2); niacin (B3); pantothenic acid (B5); biotin; vitamin K; *potassium; sodium*

Vitamin B6; folate (B9); iodine; vitamin D; magnesium; zinc; copper; selenium

Vitamin E; **iron** (*highly dependent on starting ferritin stores and ongoing losses*)

Vitamin A

Vitamin B12

Calcium and phosphorus (*mostly stored in bone*)
depleted with consequences

Micronutrient Triage: Simmering vs Urgent



Simmering deficiencies



Iron



Fatigue, low energy



Vitamin D



Bone pain, muscle weakness



Calcium



Bone pain, cramps



Folate



Fatigue, poor red cell production



Zinc



Poor wound healing, frequent infections



Copper



Hair loss, anemia, neurologic changes



B12



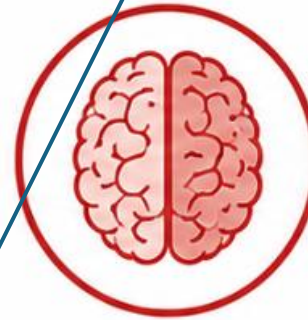
Numbness, tingling, balance problems



Gradual onset • Often nonspecific • Progressive decline



Urgent deficiencies



**Thiamine
(Vitamin B₁)
Deficiency**



Prolonged vomiting or poor intake



Rapid weight loss



Weakness, low energy



Gait change, unsteadiness



Confusion, disorientation, behavior change



Eye signs: nystagmus, ophthalmoplegia



High risk of Wernicke encephalopathy



Symptoms and context ~~may~~ **DO** require action before complete lab confirmation.

Deficiencies that simmer vs urgent

Category	Examples	Clinical pattern	Action
Simmering	Iron, vitamin D, calcium, folate, zinc, copper, B12	Gradual, nonspecific, easy to normalize until function declines	Trend symptoms plus labs, reinforce adherence, intensify supplementation, and monitor response
Urgent	B1 deficiency; severe symptomatic anemia, major electrolyte-linked or neurologic presentations	Can evolve quickly with vomiting, poor intake, rapid weight loss or delayed recognition.	Escalate immediately ; treat suspected B1 deficiency before waiting for confirmatory lab test.

Timing!!

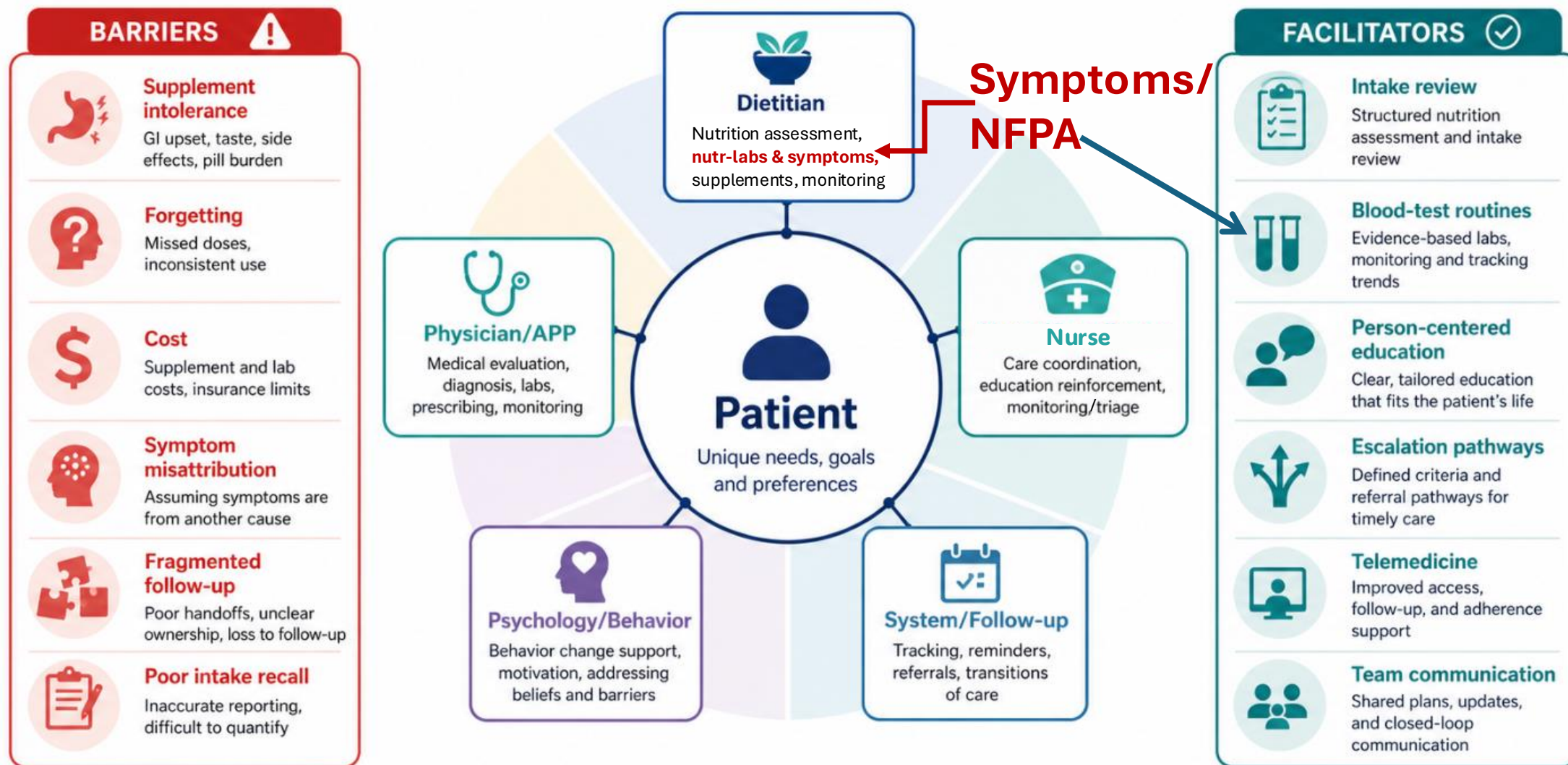




How does the multidisciplinary team (MDT) fit in?



MDT Barriers and Facilitators in Micronutrient Care



STRONGER TOGETHER

Coordinated care. Better adherence. Improved outcomes.

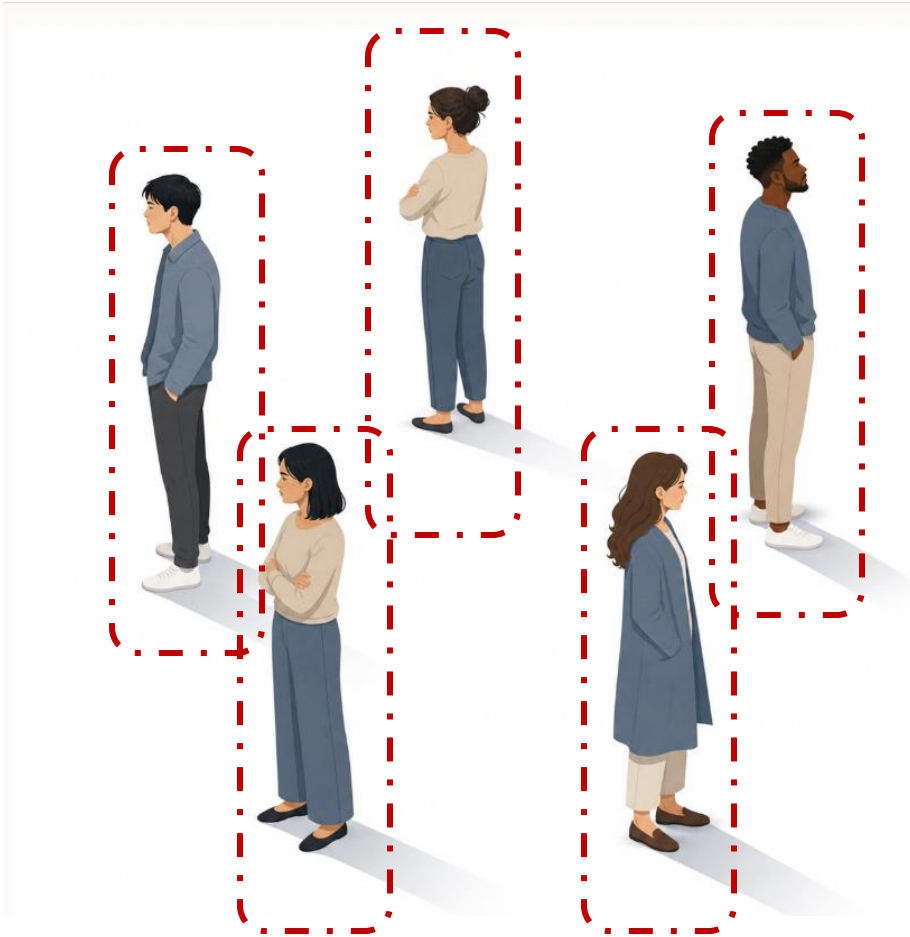


Empowering patients. Supporting teams.

Are we Multidisciplinary or Inter-disciplinary?

IFSO
XXIX IFSO
World Congress

1-4 September 2026
Toronto, Canada



Barrier /Obstacle:
Not Available –
anywhere,
anytime...



Case studies ahead: the MDT lens

- **Dietitian** – intake pattern, food variety, tolerance, supplement behavior, and pt definition of “I’m not doing much”.
 - Review lab trends and pt reported symptoms/ NFPA
- **Physician/ APP** – Assesses urgency, symptom clusters, medication effects, competing diagnoses, and escalation needs
- **Nurse** – often identifies adherence issues, symptom drift, access barriers, and missed monitoring touchpoints
- **Psychology/behavior** – Clarifies avoidance, fear, habits, health literacy, distress, and readiness that shape follow-through
- **Patient perspective** – the story may begin as fatigue, dizziness, weakness, tingling, or “I just can’t tolerate the vitamins.”



Take home message

Micronutrient deficiency is not simply a lab result.

- It is also an intake, symptom recognition, adherence, and care coordination problem across OMM and MBS.
- Ask "What has changed with intake and tolerance"
- Look & Listen when symptoms surface before labs.
 - Ask probing questions to help identify micronutrient deficiencies via symptom clusters.
- Triage urgent patterns quickly, especially thiamine risk.
- Use the MDT to turn barriers into facilitators.
- In sum, the patient's symptoms, lab data, and multidisciplinary workflow all need to be interpreted together.



Urgent presentation followed by case studies from MDT

- Cases for various micronutrient deficiencies as encountered by the MDT: surgeon, physician, nurse practitioner and RDN.
- Each case focuses on barriers and facilitators to identification and intervention.
- Different deficiencies, different timelines, different urgency

Urgent Micronutrient deficiency and serious sequelae, WE
presented by Dr Emma Patterson



XXX IFSO WORLD CONGRESS

"Advancing Multimodal Obesity Care"

24-27 August 2027

ifso2027.org



IFSO
PARIS 2027

See you in

PARIS



References

- Almandoz JP, Wadden TA, Tewksbury C, Apovian CM, Fitch A, Ard JD, Li Z, Richards J, Butsch WS, Jouravskaya I, Vanderman KS, Neff LM. Nutritional considerations with antiobesity medications. *Obesity (Silver Spring)*. 2024 Sep;32(9):1613-1631. doi: 10.1002/oby.24067. Epub 2024 Jun 10. PMID: 38853526.
- Almandoz JP, Pickett-Blakely O, Tewksbury C, Stefanski A, Gonsahn-Bollie S, Dimitriadis GK, Murro AL, Cao D, Meng Q, Neff LM. Nutritional status with tirzepatide in obesity: A post hoc analysis of the SURMOUNT-1-4 randomized clinical trials. *Obes Pillars*. 2026 Jan 23;17:100248. doi: 10.1016/j.obpill.2026.100248. PMID: 41640675; PMCID: PMC12865613.
- Christensen S, Robinson K, Thomas S, Williams DR. Dietary intake by patients taking GLP-1 and dual GIP/GLP-1 receptor agonists: A narrative review and discussion of research needs. *Obes Pillars*. 2024 Jul 25;11:100121. doi: 10.1016/j.obpill.2024.100121. Erratum in: *Obes Pillars*. 2024 Oct 02;12:100136. doi: 10.1016/j.obpill.2024.100136. PMID: 39175746; PMCID: PMC11340591.
- Drucker DJ. Efficacy and Safety of GLP-1 Medicines for Type 2 Diabetes and Obesity. *Diabetes Care*. 2024;47(11):1873-1888.
- Mozaffarian D, Agarwal M, Aggarwal M, Alexander L, Apovian CM, Bindlish S, Bonnet J, Butsch WS, Christensen S, Gianos E, Gulati M, Gupta A, Horn D, Kane RM, Saluja J, Sannidhi D, Stanford FC, Callahan EA. Obesity (Silver Spring). Nutritional priorities to support GLP-1 therapy for obesity: A joint Advisory from the American College of Lifestyle Medicine, the American Society for Nutrition, the Obesity Medicine Association, and The Obesity Society. 2025 Aug;33(8):1475-1503. doi: 10.1002/oby.24336. Epub 2025 May 30. PMID: 40445127
- Parrott J, Frank L, Rabena R, Craggs-Dino L, Isom KA, Greiman L. American Society for Metabolic and Bariatric Surgery Integrated Health Nutritional Guidelines for the Surgical Weight Loss Patient 2016 Update: Micronutrients. *Surg Obes Relat Dis*. 2017 May;13(5):727-741. doi: 10.1016/j.soard.2016.12.018. Epub 2017 Jan 19. PMID: 28392254.
- Qanaq D, O'Keeffe M, Cremona S, Bernardo WM, McIntyre RD, Papada E, Benkalkar S, Rubino F. The Role of Dietary Intake in the Weight Loss Outcomes of Roux-en-Y Gastric Bypass and Sleeve Gastrectomy: A Systematic Review and Meta-analysis. *Obes Surg*. 2024 Aug;34(8):3021-3037. doi: 10.1007/s11695-024-07183-8. Epub 2024 Jun 22. PMID: 38907132; PMCID: PMC11289176.
- Roberts KM, Estes-Doetsch H, Nahikian-Nelms M, (editors). *Academy of Nutrition and Dietetics Pocket Guide to Micronutrient Management*. Academy of Nutrition and Dietetics; 2025.
- Tronieri JS, Allison KC, DeRouen K, Amaro A, Collins KG, Roy A, Watts S, Ananna T, Wadden TA. Short- and long-term effects of semaglutide 2.4 mg on energy intake, appetite, and food reward: a 60-week, double-blind randomized controlled trial. *Am J Clin Nutr*. 2026 Aug;124(2):101403. doi: 10.1016/j.ajcnut.2026.101403. Epub 2026 Jun 20. PMID: 42323166; PMCID: PMC13494093.





**Case Studies will follow after !URGENT!
presentation**



Xtra slides



Nutrient Deficiency	Common Supplementation
Calcium	Chronic deficiency: 1.2-2.4 g daily in split doses Prophylaxis: 1.2-1.5 g daily in split doses
Iron	Deficiency: 150-300 mg elemental iron two to three times daily
Vitamin A	Severe Deficiency: 100,000 units for 3 days, then 50,000 units daily for 2 weeks, then 10,000-20,000 units daily for 2 months
Vitamin B1	Treatment: 100-500 mg daily for 5-7 days Prophylaxis: 100 mg daily
Vitamin B9 (folate)	Maintenance: 0.4 mg daily Pregnancy: 0.8 mg daily
Vitamin B12	Treatment: 1,000 mcg SQ daily for 7days, then every 7 days for 4-8 weeks, then 1,000 mcg monthly for life Prophylaxis: 1,000 mcg by mouth daily
Vitamin C	Treatment: 200 mg IV at 33 mg/min daily for 7 days. Oral (off-label): 1 to 2 g daily for 2 days, then 500 mg daily for 1 week.
Vitamin D	Deficiency in people without obesity: 50,000 IU weekly for 8-12 weeks followed by 1500-2000 IU daily maintenance dose Deficiency in individuals with obesity: 6000-10,000 IU daily for 8 weeks followed by 3000-6000 IU daily maintenance dose Prophylaxis (off-label): 1000-2000 IU daily
Vitamin E	Treatment: 15-25 IU daily
Zinc	Treatment: 0.5-1 mg/kg/day elemental zinc daily (up to 60 mg two to three times daily)

Triage: Summary of Wernicke cases (n=10) reported for 2024 in the WHO global safety database:

Rx	# cases	Age	Time to onset – if reported	Symptoms (may be overlapping)
Semaglutide-Ozempic (DM)	5 (1 male)	(37, 52, 62, 69, unknown)	2 months (n=1)	*Digestive (n=2) ±Neurological (n=1) Not reported (n=3)
Semaglutide- Wegovy (wt mgmt.)	1 female	unknown	unknown	unknown
Tirzepatide-Mounjaro (DM)	4 (1 male)	(51, 58, 60, 82)	10 months (n=1)	*Digestive (n=1): ±Neurological (n=3): Not reported (n=1)

±**Neurological**: cognitive impairment, amnesia, altered mental status, hallucinations, reduced mobility, peripheral neuropathy,, falls, muscle weakenss,

***Digestive**: n/v/d/c, abdom pain, dyspepsia, hypophagia, abdom distension, malnutrition, ileus

Signs	Symptoms	Both
Excess weight loss	Fatigue	Cold / feeling cold
Hypothermia	Lethargy	Confusion
Hypotension	Anger / irritability	Memory issues
Tachycardia	Depression	Apathy
Cardiomegaly	Psychosis	Executive dysfunction
Edema	Nausea	Mood instability
Nystagmus	Vomiting	Hallucinations
Papilledema	Anorexia / loss of appetite	Syncope / fainting
Oculomotor dysfunction	Early satiety	Dyspnea / shortness of breath
Ptosis	Abdominal pain	Diplopia / double vision
Decreased visual acuity	Tingling	Seizures
Hearing loss	Numbness	Coma
Ataxia / wide-based gait	Muscle cramps	Constipation
Immobility	Weakness / flaccidity	Poor oral intake
Temporal wasting	Paralysis	Word-finding difficulty
Trip/falls observed		Impaired focus / concentration
		Cardiovascular symptoms/arrhythmia awareness
		Unsteadiness
		Paresthesias
		Ophthalmoplegia



IS B1 Deficiency Urgent or “wait & see”?

Red flags

- Prolonged vomiting
- Rapid weight loss and poor oral intake
- Neurologic change, gait instability, eye findings, confusion, or weakness
- Dextrose/carbohydrate exposure in a depleted patient.

Practical rule

- Don't wait for a classic triad symptom or delayed lab result
- Think symptom pattern plus context.
- Early treatment prevents irreversible neurologic injury

B1 deficiency is URGENT!



Take a daily multivitamin and mineral supplement for prevention!

Nutritional priorities to support GLP-1 therapy for obesity: a joint Advisory from the American College of Lifestyle Medicine, the American Society for Nutrition, the Obesity Medicine Association and The Obesity Society

