Beyond Neurology, should endocrinology, metabolomis and gastroenterology also be integrated with Psychiatry?

Integrating **Endocrinology, Metabolism, and Gastroenterology** with Psychiatry

Mental disorders are increasingly described as **systemic** conditions involving hormones, metabolism, immune function, and the gut, rather than purely "brain-only" diseases. Across these papers, interdisciplinary care linking psychiatry with endocrinology, metabolomics, and gastroenterology is repeatedly proposed as necessary for better outcomes.

Mechanistic Links Across Systems

- **Endocrine–psychiatric bidirectionality:** Most endocrine disorders have psychological manifestations, and psychiatric illness alters hormonal activity (e.g., adrenal, thyroid), sometimes preceding endocrine symptoms and affecting quality of life and treatment adherence (Salvador et al., 2020).
- **Metabolic–psychiatric integration:** Shared mechanisms include insulin resistance, inflammation, mitochondrial dysfunction, and HPA-axis dysregulation, contributing to depression, anxiety, and cognitive problems (Gaspary et al., 2025; Seo et al., 2025; Țenea-Cojan et al., 2025; Salvador et al., 2020).
- **Gut–brain–endocrine axis:** Gut microbiota influence neurotransmitters, HPA activity, immune responses, bile acids, and metabolites like short-chain fatty acids, impacting depression, anxiety, bipolar disorder, schizophrenia, and other neuropsychiatric conditions (Verma et al., 2024; Bautista et al., 2025; Cauli & Vitale, 2022; Góralczyk-Bińkowska et al., 2022; Ortega et al., 2023; Doenyas et al., 2025; Faysal et al., 2025; Lee et al., 2025; Kim & Shin, 2018).

Examples of Systemic Pathways

Domain	Key Mechanisms Affecting Mental Health	Citations
Endocrine	HPA-axis, thyroid, sex steroids, cortisol, insulin resistance	(Gaspary et al., 2025; Seo et al., 2025; Dinneen, 2021; Țenea-Cojan et al., 2025; Salvador et al., 2020)
Metabolic	Mitochondrial dysfunction, dyslipidemia, obesity, ceramides, GDF15	(Gaspary et al., 2025; Seo et al., 2025; Țenea-Cojan et al., 2025; Tu et al., 2025)
Gut/GI	Microbiota, vagus nerve, immune and endocrine signaling, dysbiosis	(Verma et al., 2024; Bautista et al., 2025; Cauli & Vitale, 2022; Góralczyk-Bińkowska et al., 2022; Ortega et al., 2023; Doenyas et al., 2025; Faysal et al., 2025; Lee et al., 2025; Kim & Shin, 2018)

FIGURE 1 Interlinked endocrine, metabolic, and gut pathways in psychiatry

Evidence for Integrated and Multidisciplinary Care

- **Endocrinology–psychiatry:** High comorbidity between diabetes, thyroid disease, obesity and depression/psychosis; integrated care for diabetes–depression is highlighted as a promising model and already used in obesity and gender medicine clinics (Dinneen, 2021; Salvador et al., 2020). A psychoneuroendocrinology outpatient service managed complex patients via joint endocrine–psychiatric assessment, lifestyle change, and psychotropic optimization (Sonino & Peruzzi, 2009).
- **Metabolic risk management:** Protocols and frameworks co-designed by psychiatry, endocrinology, internal medicine, hepatology, and nutrition manage antipsychotic-induced dyslipidemia and cardiovascular risk through joint assessment, diet, exercise, and medication adjustment (Țenea-Cojan et al., 2025; Tu et al., 2025; Barreira et al., 2025).
- **Gastroenterology–psychiatry:** Integrated care models between gastroenterology and psychiatry are described for disorders of gut–brain interaction (though detailed results are not provided) (Khuu & Hatten-Powell, 2025), and broader reviews argue that microbiome-targeted interventions (diet, probiotics, FMT) should become part of personalized psychiatry (Verma et al., 2024; Bautista et al., 2025; Cauli & Vitale, 2022; Góralczyk-Bińkowska et al., 2022; Ortega et al., 2023; Doenyas et al., 2025; Faysal et al., 2025; Lee et al., 2025; Kim & Shin, 2018).
- **Multidisciplinary models:** A scoping review concludes that integrated, multidisciplinary care with routine mental health screening and coordinated treatment is essential for patients with internal medical diseases and psychiatric comorbidities (Țenea-Cojan et al., 2025).

Implications for Psychiatric Practice

- Research emphasizes **holistic, precision approaches** that jointly address neuroendocrine, metabolic, and gut–brain factors instead of treating psychiatric symptoms in isolation (Gaspary et al., 2025; Seo et al., 2025; Verma et al., 2024; Bautista et al., 2025; Țenea-Cojan et al., 2025; Ortega et al., 2023; Doenyas et al., 2025; Lee et al., 2025; Sarris et al., 2015).
- Proposed innovations include hormonal adjuncts (e.g., hCG hormetic therapy), metabolic targeting (mitochondria, GDF15 pathways), microbiome modulation, and chronobiology-informed interventions (Gaspary et al., 2025; Seo et al., 2025; Bautista et al., 2025; Ortega et al., 2023; Faysal et al., 2025; Kim & Shin, 2018).

Summary

Across endocrine, metabolic, and gut domains, evidence consistently supports tight biological and clinical links with mental disorders and shows practical benefits of joint protocols and specialized services. Taken together, these studies argue that psychiatry should be systematically integrated not only with neurology, but also with **endocrinology, metabolic medicine, and gastroenterology** to deliver truly comprehensive, personalized care.

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