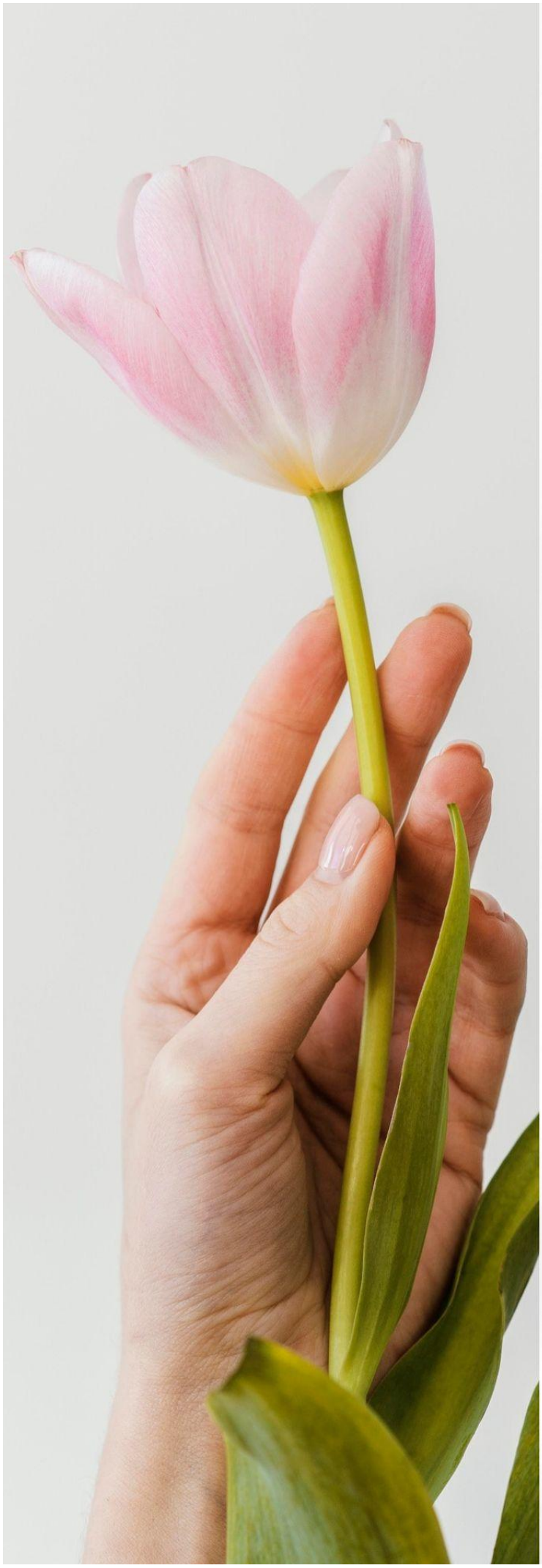


HORMONES & MENTAL HEALTH:

PMHNPs IN THE ENDOCRINE PSYCHIATRY NEXUS

HORMONES & MENTAL HEALTH: PMHNPs IN THE ENDOCRINE PSYCHIATRY NEXUS

ANCC ACCREDITED NCPD HOURS: 1.5hrs

TARGET AUDIENCE: PMHNP

NEED ASSESSMENT

An expanding body of evidence underscores the pressing need to enhance Psychiatric Mental Health Nurse Practitioners' (PMHNPs) competencies in recognising and managing the complex relationship between endocrine disorders and psychiatric symptoms. Endocrine conditions such as hypothyroidism, diabetes mellitus, and adrenal dysfunction frequently contribute to or exacerbate mental health presentations, complicating diagnostic clarity and therapeutic outcomes. A 2024 meta-analysis published in the *Journal of Affective Disorders* identified subclinical hypothyroidism as a significant factor in treatment-resistant depression, emphasising the importance of endocrine screening in psychiatric evaluation. Likewise, a 2025 cohort study in *Diabetes Care* revealed that a substantial proportion of individuals with diabetes exhibit undiagnosed psychiatric symptoms, adversely affecting both disease management and quality of life.

Despite these associations, current PMHNP educational curricula remain predominantly focused on psychiatric diagnostics and psychopharmacologic management, offering limited integration of endocrine content. A 2024 national survey published in the *Journal of the American Psychiatric Nurses Association* reported that 89% of PMHNPs felt inadequately prepared to interpret endocrine-related laboratory values or engage in collaborative, integrated care models. This gap in training has tangible clinical implications, contributing to delayed recognition of comorbid conditions, inappropriate treatment approaches, and suboptimal patient outcomes.

PMHNPs need targeted continuing education on the endocrine-psychiatry interface to address this gap. Enhanced training will equip them to provide holistic, evidence-based care, improve patient outcomes, and better meet the complex needs of individuals with intertwined mental and physical health conditions.

OBJECTIVES

- **Describe** the PMHNP's role in understanding the bidirectional relationship between endocrine disorders and psychiatric symptoms, emphasizing how hormonal imbalances affect mood, cognition, and behaviour.
- **Identify** common endocrine disorders that frequently present with psychiatric manifestations, and recognize the importance of early detection by PMHNPs in mental health settings.
- **Assess** patients for possible endocrine contributions to mental health symptoms by incorporating relevant history-taking, screening tools, and appropriate laboratory tests into psychiatric evaluation
- **Apply** evidence-based, collaborative care strategies as a PMHNP by coordinating with endocrinologists and other healthcare professionals to manage patients with co-occurring psychiatric and endocrine conditions
- **Develop** treatment strategies that address both psychiatric and hormonal aspects of care, including medication management, monitoring, and appropriate referrals.
- **Educate** patients and families from the PMHNP perspective on the interconnectedness of hormones and mental health, promoting shared decision-making, treatment adherence, and improved health literacy.

GOAL

The goal of this continuing education activity is to enhance the competence of Psychiatric Mental Health Nurse Practitioners (PMHNPs) in identifying and managing the interconnected influences of endocrine disorders and psychiatric conditions. This education aims to promote integrated, evidence-based care that optimizes patient outcomes through a comprehensive understanding of hormonal impacts on mental health.

INTRODUCTION

The complex interplay between hormones and mental health is increasingly recognized as a critical dimension in psychiatric care. Endocrine disorders-including thyroid dysfunction, diabetes mellitus, adrenal imbalances, and fluctuations in reproductive hormones, are well-documented to influence a

spectrum of psychiatric symptoms such as mood disturbances, cognitive impairment, and behavioural changes. This bidirectional relationship poses significant diagnostic and therapeutic challenges. Psychiatric symptoms may obscure underlying endocrine pathology, while hormonal imbalances can exacerbate, mimic, or even precipitate primary mental health conditions.

Psychiatric Mental Health Nurse Practitioners (PMHNPs), as essential frontline providers, are uniquely positioned to bridge the gap between psychiatry and endocrinology. Their advanced clinical training enables them to assess, diagnose, and manage psychiatric symptoms with a holistic perspective that incorporates the potential impact of endocrine dysfunction. By maintaining a high index of suspicion for hormonal contributions to psychiatric presentations, PMHNPs facilitate earlier identification and more comprehensive management of these complex cases.

Despite this critical role, current PMHNP curricula often offer limited formal education on the endocrine influences in mental health. This gap may hinder the practitioner's ability to recognize and address the full spectrum of factors affecting patient well-being.

This continuing education activity is designed to strengthen PMHNPs' expertise at the intersection of endocrine and psychiatric care. By integrating targeted hormonal assessment, evidence-based management strategies, and interdisciplinary collaboration into psychiatric practice, PMHNPs can enhance diagnostic accuracy, tailor treatment plans more effectively, and deliver truly holistic, patient-centered care.

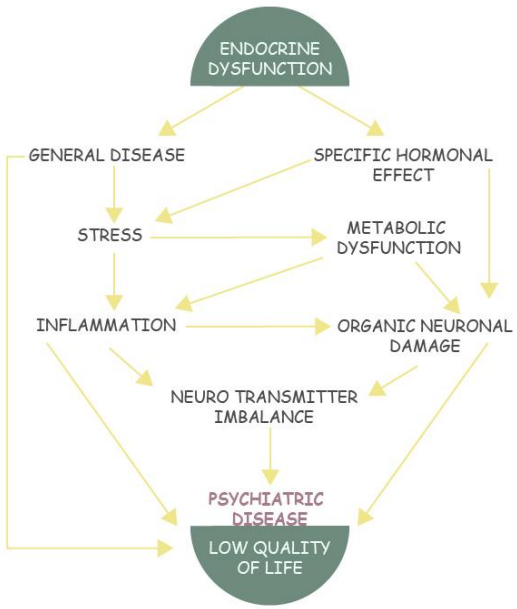
UNDERSTANDING THE BIDIRECTIONAL RELATIONSHIP BETWEEN ENDOCRINE DISORDERS AND PSYCHIATRIC SYMPTOMS

Psychiatric Mental Health Nurse Practitioners (PMHNPs) are uniquely positioned to address the complex interplay between endocrine function and mental health. Endocrine disorders can directly induce psychiatric symptoms or worsen existing mental health conditions, while psychiatric illnesses themselves can alter endocrine system functioning. This bidirectional relationship requires PMHNPs to have a thorough understanding of hormonal influences on the brain to optimize assessment, diagnosis, and treatment.

THE PATHWAYS LINKING ENDOCRINE DYSFUNCTION TO PSYCHIATRIC DISEASE

Endocrine dysfunction, involving hormone imbalances from glands such as the thyroid or

adrenal, initiates a complex cascade affecting both physical and mental health. It contributes to systemic illness that elevates stress and promotes inflammation, while also directly causing metabolic disturbances and neuronal damage. These processes collectively disrupt neurotransmitter balance, which is critical for regulating mood, cognition, and behaviour. The resulting interplay of stress, inflammation, metabolic dysfunction, and neurochemical imbalance leads to a decline in quality of life and increases vulnerability to psychiatric disorders like depression and anxiety. Moreover, psychiatric illness and reduced quality of life can exacerbate stress and inflammation, perpetuating a cyclical relationship. Recognizing these interconnected mechanisms is vital for comprehensive assessment and management in clinical practice, particularly at the interface of endocrine and mental health care.



THYROID DISORDERS AND PSYCHIATRIC SYMPTOMS

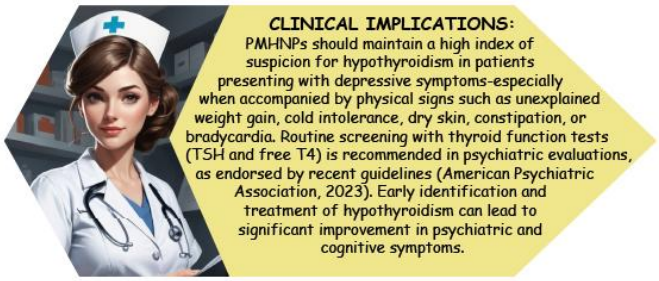
Thyroid disorders often manifest with psychiatric symptoms that closely resemble primary mental health conditions. Psychiatric Mental Health Nurse Practitioners (PMHNPs) are essential in identifying these clinical presentations, implementing appropriate screening protocols, and coordinating timely endocrine evaluation and treatment. This integrative approach is critical for optimising psychiatric outcomes and ensuring comprehensive patient care.

1. Hypothyroidism

HYPOTHYROIDISM [too little thyroid hormone]	
PSYCHIATRIC	PHYSICAL
Depression	Fatigue
Cognitive Dysfunction	Weight gain
Irritability	Dry skin
Memory Loss	Intolerance to cold Coarse dry hair Weakness and/or muscle aches Loss of libido Abnormal menstrual cycle Constipation
HYPERTHYROIDISM [too much thyroid hormone]	
PSYCHIATRIC	PHYSICAL
Anxiety	Heart palpitations or rapid heart beat
Restlessness	Insopmnia
Exagerated emotional responsses such as laughing or crying that is uncontrollable out of proportion	Breathlessness
Feelings of unhappiness and dissatisfaction	Weight loss Increased bowel movements Light or absent menstrual periods Trembling hands Warm moist skin Staring gaze

Hypothyroidism, characterized by reduced levels of thyroid hormones (T3 and T4), is closely linked to a spectrum of psychiatric manifestations. The most common presentation is **depressive symptoms**-including low mood, fatigue, diminished motivation, and anhedonia. Cognitive slowing is also frequently observed, manifesting as memory impairment, decreased attention span, and reduced processing speed. In severe, untreated cases, **psychosis** (sometimes termed "myxedema madness") may occur, although this is rare in the era of routine screening.

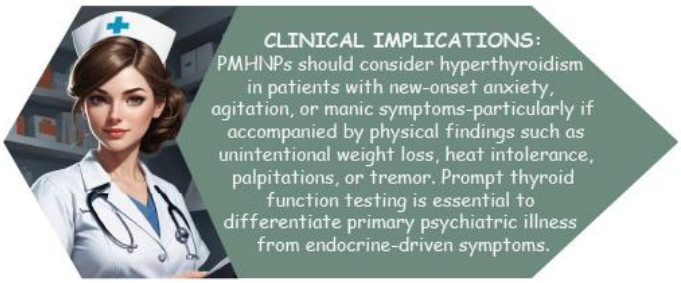
Mood changes in hypothyroidism can be **subtle and insidious**, often overlapping with primary depressive disorders. Patients may also exhibit **emotional lability, apathy, and social withdrawal**. These symptoms can significantly impact daily functioning an quality of life.



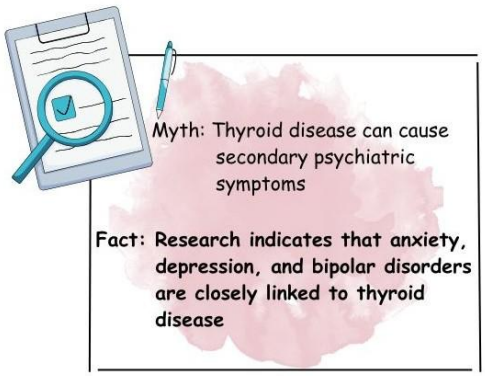
A 2022 meta-analysis in Frontiers in Psychiatry confirmed that patients with hypothyroidism have a significantly increased risk of depressive and cognitive symptoms compared to euthyroid controls, and that thyroid hormone replacement results in notable psychiatric improvement (Zhou et al., 2022).

2. Hyperthyroidism

Hyperthyroidism, defined by excess production of thyroid hormones, is associated with a different psychiatric profile. Patients frequently present with **anxiety, irritability, emotional lability, restlessness, and, in some cases, acute psychosis**. These symptoms can closely mimic primary anxiety disorders or manic episodes, complicating the diagnostic process. Common complaints include **insomnia, heightened sensitivity to stimuli, hyperactivity, and difficulty concentrating**. The overlap between hyperthyroid symptoms and psychiatric disorders can lead to misdiagnosis and inappropriate treatment if the underlying endocrine disorder is not recognized.

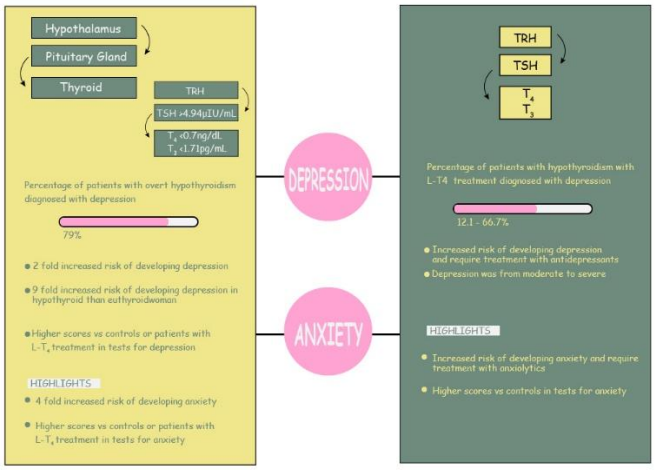


A 2023 review in The Lancet Diabetes & Endocrinology emphasised the importance of thyroid screening in psychiatric settings, noting that up to 30% of patients with new-onset mood or anxiety disorders may have previously undiagnosed thyroid dysfunction (Taylor et al., 2023).



3. Summary of Results

The association between acquired hypothyroidism and the subsequent development of depressive or anxiety disorders in adult patients.



The figure on the left (I) depicts an adult patient with acquired hypothyroidism who has not received L-T_4 treatment and their thyroid hormone levels (Usman et al., 2023). It is evident that there is a correlation between overt-acquired hypothyroidism and an increased risk of developing depression or anxiety

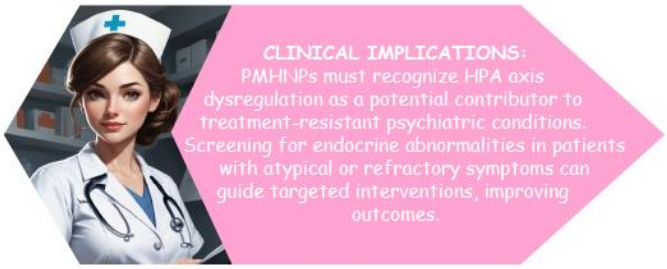
The figure on the right (II) shows an adult patient with acquired hypothyroidism who is undergoing L-T_4 treatment. Furthermore, there is evidence indicating that depression or anxiety may be present despite the use of thyroid

The study found that people with acquired hypothyroidism have a higher risk of developing psychiatric disorders compared to those without hypothyroidism. The most common mental health issues seen were depression and anxiety. The authors suggest that regular mental health screening and support should be considered for patients diagnosed with hypothyroidism.

ADRENAL HORMONE AND PSYCHIATRIC SYMPTOMS

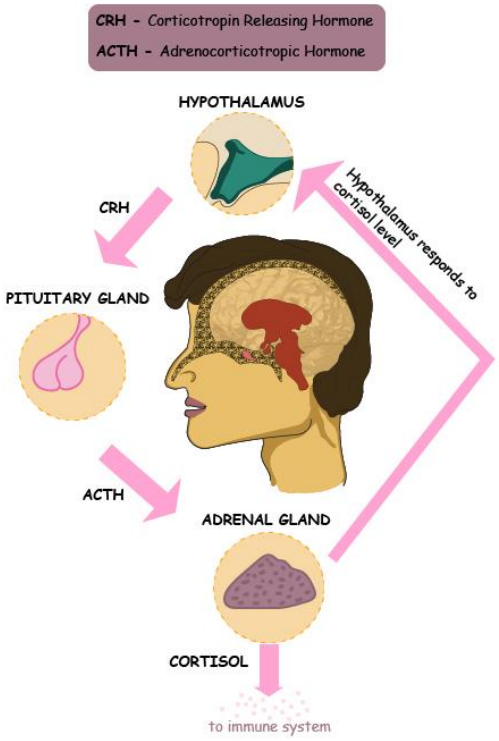
1. Hypothalamic-Pituitary-Adrenal (HPA) Axis Dysregulation:

The hypothalamic-pituitary-adrenal (HPA) axis is a critical neuroendocrine system that regulates cortisol secretion, enabling adaptation to stress. Dysregulation of the HPA axis, caused by chronic stress, trauma, or adrenal disorders such as Cushing's syndrome or Addison's disease, disrupts cortisol homeostasis, contributing to psychiatric symptoms.



2. The Stress Response System: HPA Axis Mechanism

The hypothalamic-pituitary-adrenal (HPA) axis is the body's central stress response system and plays a critical role in psychiatric health. When the brain perceives stress, the hypothalamus releases corticotropin-releasing hormone (CRH), which prompts the pituitary gland to secrete adrenocorticotropic hormone (ACTH). ACTH then stimulates the adrenal glands to produce cortisol, the primary stress hormone responsible for increasing glucose availability, modulating immune responses, and influencing mood, cognition, and behaviour. Rising cortisol levels initiate a negative feedback loop that suppresses further CRH and ACTH release to maintain balance.



Dysregulation of this system, due to chronic stress or endocrine disorders, can lead to psychiatric symptoms such as depression, anxiety, memory impairment, apathy, irritability, and mood swings. For Psychiatric Mental Health Nurse Practitioners (PMHNPs), understanding this mechanism is essential to recognize when psychiatric presentations may stem from underlying HPA axis disturbances. PMHNPs should assess for physical indicators like weight or blood pressure changes, screen for atypical or treatment-resistant psychiatric symptoms, and collaborate with endocrinologists to ensure timely and integrated care. Ultimately, awareness of HPA axis dysfunction enables PMHNPs to deliver comprehensive, biopsychosocial treatment that addresses both mental and physical dimensions of health.

3. Elevated Cortisol (Hypercortisolism):

Chronic elevation of cortisol, as seen in conditions such as Cushing's syndrome or prolonged psychological stress, has a well-established association with a range of psychiatric symptoms, including depression, anxiety, mood lability, irritability, and cognitive deficits, particularly in memory and executive functioning. Sustained hyperactivation of the hypothalamic-pituitary-adrenal (HPA) axis contributes to neurobiological changes, notably

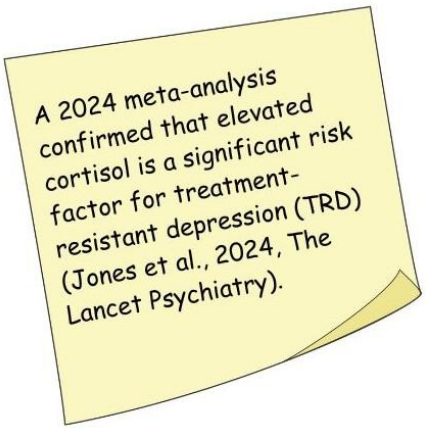
hippocampal atrophy, which underlies many of these cognitive and mood disturbances.

Research shows that chronic HPA axis activation and excess cortisol can cause atrophy of the hippocampus and other brain regions involved in mood and cognition, contributing to both depression and cognitive dysfunction. For example, a study found that 66% of Cushing's syndrome patients exhibited psychiatric symptoms, primarily depression and anxiety, with rates decreasing significantly after effective treatment of hypercortisolaemia. This highlights the reversible nature of many psychiatric symptoms when the underlying endocrine disorder is addressed.

Cortisol hypersecretion affects the hippocampus, prefrontal cortex, and amygdala, leading to:

- **Depressive symptoms:**
  Up to 50–80% of patients with Cushing's syndrome experience major depressive disorder (MDD) or subsyndromal depression **(Santos et al., 2022, *Journal of Clinical Endocrinology & Metabolism*).**
- **Anxiety and irritability:**
  Hypercortisolism amplifies amygdala hyperactivity, increasing emotional reactivity **(Kiem et al., 2024, *Neuroscience & Biobehavioral Reviews*).**
- **Cognitive impairments:**
  Memory deficits and executive dysfunction arise from hippocampal and prefrontal cortex damage, with studies showing reduced hippocampal volume in chronic hypercortisolism **(Starkman et al., 2023, *Biological Psychiatry*).**
- **Mood instability:**
  Rapid mood swings and emotional lability are common, mimicking bipolar disorder in severe cases.

Excess cortisol causes neurotoxic effects, including dendritic atrophy and reduced neurogenesis in the hippocampus, impairing memory consolidation and emotional regulation

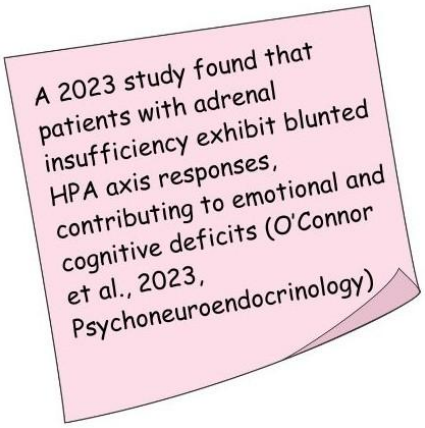


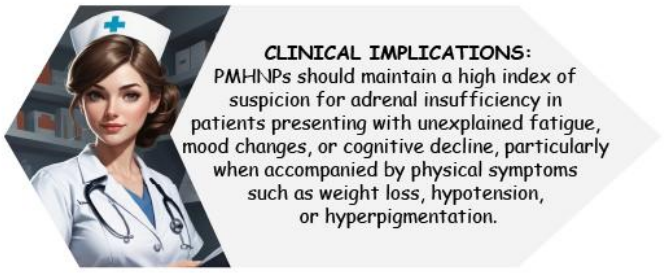
4. **Low Cortisol (Adrenal Insufficiency):**
   Low cortisol levels happen in conditions like Addison's disease or when the pituitary gland isn't working properly (called

secondary adrenal insufficiency). Cortisol is a key hormone that helps the body handle stress, maintain energy, and support brain function.

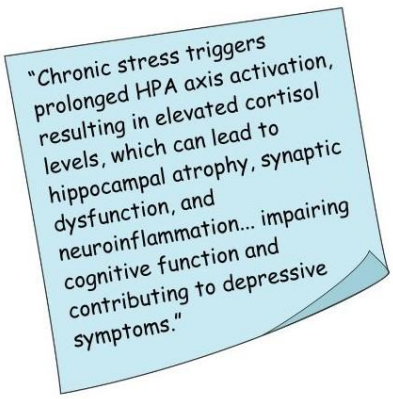
Adrenal insufficiency, including primary (Addison's disease) and secondary causes (e.g., pituitary dysfunction), results in hypocortisolism. Low cortisol levels impair energy metabolism and stress resilience, leading to:

- **Fatigue and apathy**:
  Profound exhaustion and motivational deficits mimic depressive disorders.
- **Irritability**:
  Emotional dysregulation is common, often presenting as low frustration tolerance.
- **Cognitive difficulties**:
  Impaired attention and processing speed are reported, potentially due to glucocorticoid deficiency in the prefrontal **cortex (Tiemensma et al., 2023, *Endocrine Reviews*).**
- **Depressive symptoms**:
  Up to 40% of patients with Addison's disease report depressive symptoms, often resolving with hormone replacement **(Anglin et al., 2022, *Journal of Affective Disorders*).**





HPA axis dysregulation, whether through hypercortisolism or hypercortisolism, significantly impacts psychiatric health. PMHNPs play a pivotal role in identifying adrenal contributions to mental health disorders, integrating endocrine screening, and collaborating with specialists to optimize patient outcomes. Recent studies underscore the importance of personalized approaches, leveraging biomarkers and neuroimaging to guide treatment.



REPRODUCTIVE HORMONES AND PSYCHIATRIC SYMPTOMS

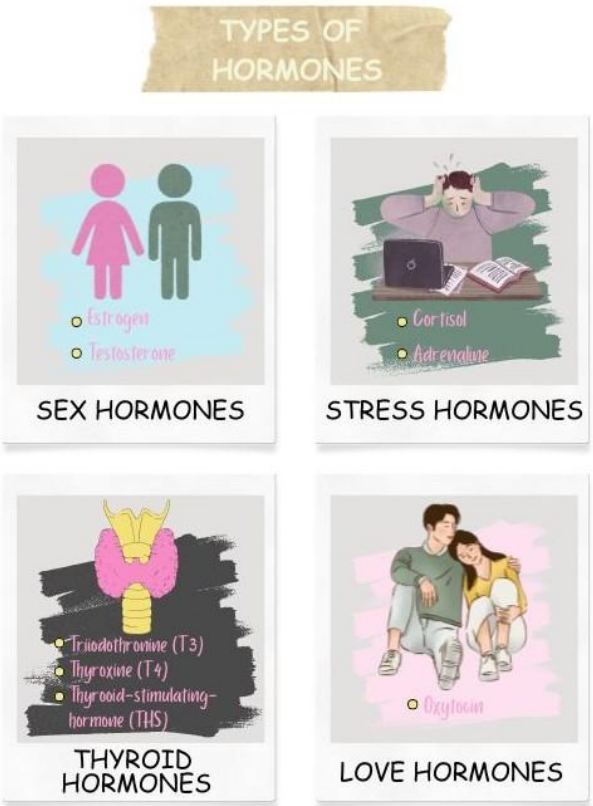
Reproductive hormones, including oestrogen, progesterone, and testosterone, play a critical role in modulating mood, cognition, and behaviour. Fluctuations in these hormones across life stages such as the menstrual cycle, pregnancy, postpartum period, menopause, and andropause, can precipitate or exacerbate psychiatric symptoms. Recent research underscores the complex interplay between reproductive hormones and neurotransmitter systems, offering new avenues for personalized psychiatric care (Gordon et al., 2023, *Biological Psychiatry*). This guide provides PMHNPs with evidence-based insights to assess, manage, and collaborate on hormone-related psychiatric conditions.

SEX HORMONES AS CENTRAL REGULATORS

Sex hormones, especially oestrogen and progesterone, play a foundational role in regulating mood and sleep. Their effects are not uniform across individuals; rather, they are influenced by genetic, biological, and environmental factors. This means that the same hormonal fluctuation may lead to noticeable mood or sleep changes in one person, while another may remain unaffected. For PMHNPs, this highlights the importance of considering individual vulnerability when assessing hormone-related psychiatric symptoms.

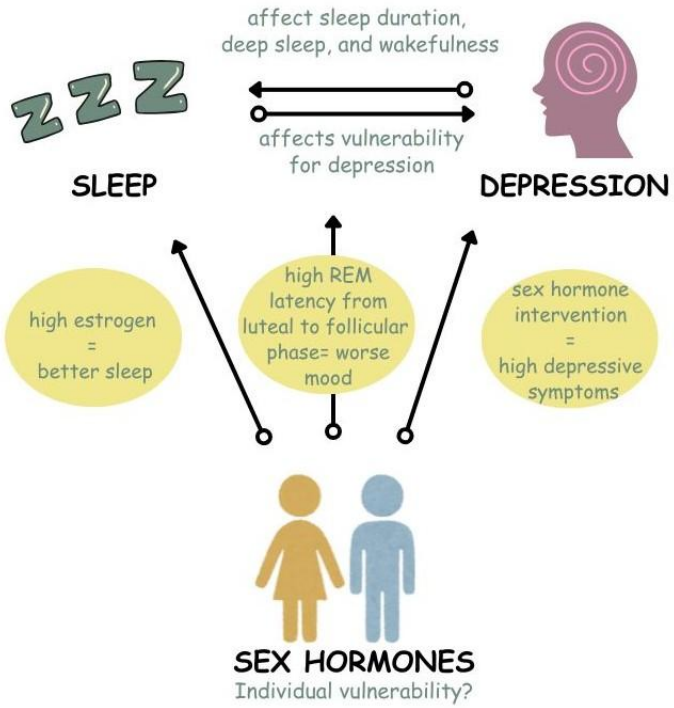
SEX HORMONES AND SLEEP

Oestrogen has been shown to promote better sleep quality by enhancing sleep continuity and increasing the depth of non-REM sleep. Progesterone may also have sedative properties. However, hormonal shifts across the menstrual cycle, particularly during the transition from the luteal to follicular phase, can lead to disrupted sleep patterns, such as delayed REM onset. These changes may correspond with mood disturbances, which are commonly reported in conditions like premenstrual dysphoric disorder (PMDD)



SLEEP AND DEPRESSION

There is a well-established bidirectional relationship between sleep and depression. Poor sleep, marked by decreased total sleep time, fragmented sleep, and diminished slow-wave sleep, can increase the risk of developing depression. Conversely, individuals with depression often experience sleep problems, such as insomnia or hypersomnia. PMHNPs must assess sleep patterns as both a symptom and a contributing factor in mood disorders.



SEX HORMONES AND DEPRESSION

Fluctuations in sex hormones, particularly during puberty, the menstrual cycle, postpartum period, and menopause, are associated with increased vulnerability to depression in biologically female individuals. These hormonal shifts can trigger or exacerbate mood symptoms in sensitive individuals. Hormone-based treatments, such as oestrogen therapy, have shown promise in alleviating depressive symptoms in certain populations, indicating that hormonal modulation may serve as a valuable adjunct in psychiatric care.

INTERCONNECTED PATHWAYS

The interactions between sex hormones, sleep, and depression are complex and interconnected. Sex hormones influence mood both directly and indirectly, by impacting sleep regulation. Disrupted sleep, in turn, can worsen mood or trigger depressive episodes. Recognizing this loop is vital for PMHNPs, as addressing one component (e.g., sleep disturbance) can yield improvements in another (e.g., depressive symptoms).

OESTROGEN AND PROGESTERONE: IMPACT ON FEMALE MENTAL HEALTH

1. **Hormonal Fluctuations and Mood Disorders:**

   Women are two to three times more likely than men to experience depression, with risk peaking during reproductive transitions. Research shows that *sensitivity to changes*- rather than absolute levels-of oestrogen and progesterone underlies the development of reproductive mood disorders (RMDs), such

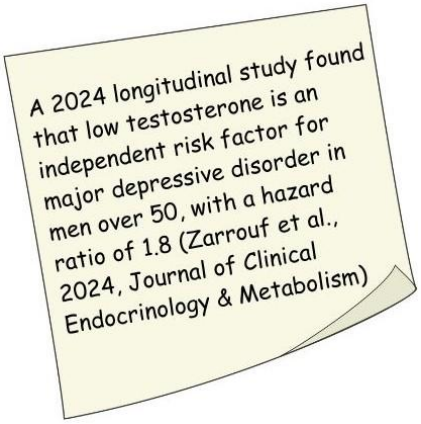
as premenstrual dysphoric disorder (PMDD), peripartum depression, and perimenopausal depression.

2. **Premenstrual Dysphoric Disorder (PMDD):**
   Up to 13–19% of reproductive-aged women experience clinically significant premenstrual mood disturbance, with marked mood swings, irritability, depression, and anxiety in the luteal phase. These symptoms are linked to heightened sensitivity to normal hormonal changes.

3. **Postpartum Depression:**
   Approximately 25% of women experience significant mood symptoms during or following pregnancy. Rapid drops in oestrogen and progesterone after childbirth are major contributors to postpartum depression and, in rare cases, psychosis.
4. **Perimenopausal Depression:**
   As many as 45–68% of women report mood symptoms during the menopausal transition, often accompanied by sleep disturbances and cognitive complaints ("brain fog"). Declining oestrogen is a key factor.
5. **Neurotransmitter Modulation:**
   Oestrogen and progesterone influence key neurotransmitter systems, including serotonin, dopamine, and GABA, which regulate mood and cognition. Oestrogen, in particular, enhances serotonergic activity, which is associated with improved mood and cognitive function

TESTOSTERONE

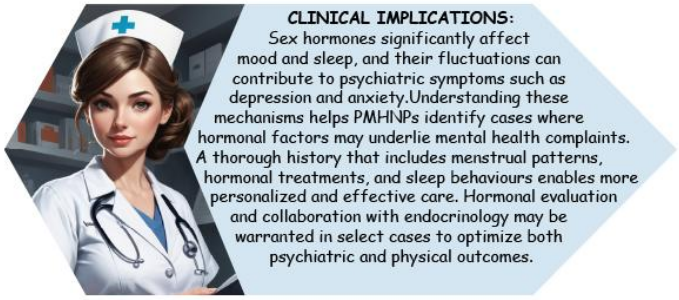
Testosterone influences mood, energy, and cognition through its effects on dopamine, serotonin, and neuroplasticity in the prefrontal cortex and amygdala. Declining testosterone levels, seen in aging men (andropause), hypogonadism, or endocrine disorders, are linked to psychiatric symptoms. Studies estimate that 20–40% of men with low testosterone (<300 ng/dL) experience depressive symptoms, fatigue, irritability, or cognitive decline (Walther et al., 2023, *Andrology*).



A recent review also suggests that testosterone may serve as a biomarker for depression risk in both men and women, with specific depressive symptoms more closely linked to testosterone levels.

1. **Testosterone and Psychiatric Disorders in Women:**

   In women, low testosterone (as seen in menopause or certain endocrine disorders) may contribute to fatigue, low libido, and mood changes, but the data are less robust than in men. Conversely, hyperandrogenism (e.g., in polycystic ovary syndrome) can be associated with increased irritability, aggression, and sometimes mood instability.



Common Endocrine Disorders Frequently Presenting with Psychiatric Manifestations

Endocrine disorders frequently present with psychiatric symptoms, often mimicking or exacerbating mental health conditions. These symptoms can complicate diagnosis and treatment, particularly in mental health settings where hormonal aetiologies may be overlooked. Psychiatric mental health nurse practitioners (PMHNPs) are uniquely positioned to identify these disorders early, improving patient outcomes through timely intervention and interdisciplinary collaboration. This guide outlines common endocrine disorders with psychiatric manifestations, their clinical presentations, and the critical role of PMHNPs in early detection.

ENDOCRINE DISORDER	COMMON PSYCHIATRIC SYMPTOMS
Hypothyroidism	Depression, cognitive decline, memory loss, fatigue, psychosis ("myxedema madness"), emotional lability
Hyperthyroidism	Anxiety, irritability, insomnia, agitation, mania, psychosis, restlessness, attention problems
Diabetes Mellitus	Depression, anxiety, eating disorders, psychomotor agitation, sleep disturbances
Cushing's Syndrome	Major depression, anxiety, irritability, mania, cognitive impairment, psychosis
Addison's Disease	Apathy, fatigue, irritability, depression, cognitive difficulties
Autoimmune Encephalopathies (e.g., Hashimoto's)	Personality changes, memory loss, delusions, hallucinations, seizures, dementia
Hyperprolactinemia/Ovarian Disorders	Mixed anxious and depressive symptoms, mood swings
Polycystic Ovary Syndrome (PCOS)	Depression, body image disturbance, anxiety, emotional dysregulation
Perimenopause/Menopause	Mood swings, depressive symptoms, sleep disturbances, anxiety

IMPORTANCE OF EARLY DETECTION

Endocrine disorders that present with psychiatric symptoms are often mistaken for primary mental health conditions, leading to delayed or inappropriate treatment. For

example, studies show that up to 50% of patients with Cushing's syndrome are initially misdiagnosed with depression or anxiety before an endocrine issue is identified (Santos et al., 2022).

Early recognition by PMHNPs can lead to:

- **Improved Outcomes:** Treating the underlying hormonal imbalance, such as with thyroid hormone or cortisol correction, can significantly reduce psychiatric symptoms.
- **Prevention of Medical Complications**: Unmanaged endocrine disorders can result in serious health risks, including cardiovascular disease, osteoporosis, and adrenal crisis.
- **Cost-Effective Care:** Prompt diagnosis avoids unnecessary hospitalizations, prolonged psychiatric care, and ineffective medication trials.
- **Better Quality of Life:** Timely treatment of both physical and mental symptoms helps patients return to normal function and reduces the stigma of being misdiagnosed.

INCORPORATING ENDOCRINE ASSESSMENT INTO PSYCHIATRIC EVALUATION

Endocrine disorders often present with psychiatric symptoms, such as depression, anxiety, irritability, and cognitive impairment, which can mimic or exacerbate primary mental health conditions. Psychiatric mental health nurse practitioners (PMHNPs) are uniquely positioned to identify these contributions through comprehensive assessments, enabling timely diagnosis and treatment. This guide outlines a standardized approach to assessing endocrine contributions to mental health symptoms, integrating targeted history-taking, validated screening tools, and appropriate laboratory tests.

IMPORTANCE OF ASSESSING ENDOCRINE CONTRIBUTIONS

Endocrine dysfunction, including disorders of the hypothalamic-pituitary-adrenal (HPA) axis, thyroid, reproductive hormones, and glucose metabolism, can significantly impact mental health. For example, up to 50–80% of patients with Cushing's syndrome experience depression, and 20–50% of those with hypothyroidism report depressive symptoms **(Santos et al., 2022, *Journal of Clinical Endocrinology & Metabolism*; Samuels et al., 2023, *Journal of Clinical Endocrinology & Metabolism*).** Failure to identify these conditions can lead to misdiagnosis, treatment resistance, and prolonged patient suffering. PMHNPs must systematically evaluate endocrine factors to ensure holistic care and optimize outcomes.

COMPONENTS OF THE ASSESSMENT

Targeted History-Taking: Identifying Endocrine Contributions to Psychiatric Presentations

A comprehensive clinical history remains the cornerstone for recognizing endocrine dysfunction in psychiatric patients. Psychiatric-mental health nurse practitioners (PMHNPs) should integrate both psychiatric and endocrine-focused questions to guide diagnostic clarity and prompt appropriate investigations.

1. Psychiatric and General Medical History

- **Symptom Onset, Duration, and Pattern:** Evaluate the temporal characteristics of mood, cognitive, or behavioural symptoms. Cyclical mood changes (e.g., premenstrual, perimenopausal, postpartum) or seasonal fluctuations (as in hypothyroidism) may suggest hormonal influences. Postpartum depression (PPD) and premenstrual dysphoric disorder (PMDD) are classical examples of hormonally modulated mood disturbances.
- **Treatment Resistance or Atypical Response:** Document any history of treatment-resistant depression (TRD), paradoxical response, or adverse effects to psychotropics. These may serve as red flags for underlying endocrine dysfunction (Jones et al., 2024, *The Lancet Psychiatry*).
- **Medical Comorbidities:** Inquire about conditions commonly associated with endocrine abnormalities, such as type 2 diabetes mellitus, obesity, autoimmune thyroiditis, or polycystic ovary syndrome (PCOS).
- **Medication History:** Assess for current or past use of medications that can alter endocrine homeostasis:
  - **Glucocorticoids** → Cushingoid features, adrenal suppression
  - **Hormonal contraceptives** → Mood destabilization, menstrual changes
  - **Antipsychotics** → Prolactin elevation, metabolic syndrome
  - **Lithium** → Thyroid dysfunction

2. Endocrine-Specific Review of Systems

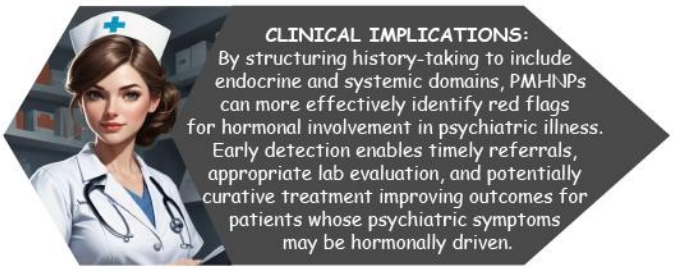
- **Hypothalamic–Pituitary–Adrenal (HPA) Axis:** Ask about features such as central weight gain, facial rounding, hypertension, or glucose intolerance (suggestive of hypercortisolism/Cushing's), as well as fatigue, hyperpigmentation, and salt craving (suggestive of adrenal insufficiency).
- **Thyroid Function:** Screen for classic signs like cold/heat intolerance, unexplained weight changes,

hair thinning, dry skin, constipation, or palpitations.

- **Reproductive Hormones**:
  For women: Explore menstrual irregularities, premenstrual symptom severity, and menopausal complaints (e.g., hot flashes, sleep disruption).
  For men: Inquire about decreased libido, erectile dysfunction, or reduced morning erections.
- **Metabolic Clues:**
  Investigate symptoms such as polyuria, polydipsia, visual changes, or hypoglycaemic episodes, which may indicate diabetes, pituitary adenomas, or insulin dysregulation

3. Life Stage and Psychosocial Stressors

- **Reproductive Milestones:**
  For women, note the phase of the menstrual cycle, pregnancy status, postpartum period, or perimenopause/menopause. For men, assess for signs of andropause or testosterone decline.
- **Chronic Stress and HPA Axis Dysregulation:**
  Evaluate for prolonged exposure to psychosocial stressors, trauma, or sleep disruption, all of which can exacerbate or mimic endocrine-related psychiatric symptoms through dysregulation of the HPA axis.



PHYSICAL EXAMINATION: DETECTING ENDOCRINE CLUES IN PSYCHIATRIC PATIENTS

A focused physical exam plays a critical role in identifying underlying endocrine disorders that may manifest with psychiatric symptoms. PMHNPs, while primarily operating in mental health settings, should incorporate targeted physical assessments to detect subtle systemic signs suggestive of hormonal imbalance.

KEY PHYSICAL EXAM DOMAINS

EXAM AREA	FINDINGS SUGGESTIVE OF ENDOCRINE DYSFUNCTION	ASSOCIATED CONDITIONS
Vital Signs	▪ Hypertension = Cushing's syndrome ▪ Hypotension = Adrenal insufficiency ▪ Tachycardia = Hyper-thyroidism	Cushing's, Addison's, and Thyroid disorders
General Appearance	▪ Central obesity ▪ Moon facies ▪ Dorsocervical fat pad ("buffalo hump") ▪ Hyperpigmentation of skin folds or mucosa	Cushing's syndrome, Addison's disease
Skin and Hair	▪ Dry, coarse skin ▪ Thinning scalp hair or lateral eyebrow loss ▪ Hirsutism (excess facial /body hair) ▪ Acne/oily skin	Hypothyroidism, PCOS, Congenital Adrenal Hyperplasia
Neck Examination	▪ Diffuse goiter ▪ Thyroid nodules ▪ Tender thyroid (thyroiditis)	Hypo-/Hyperthyroidism, Thyroiditis, Graves' disease
Neurological	▪ Fine tremor (hands outstretched) ▪ Brisk vs. delayed deep tendon reflexes (DTRs) ▪ Myopathy (proximal muscle weakness)	Hyperthyroidism (tremor), Hypothyroidism (delayed DTRs), Cushing's (myopathy)

Best Practice Tip for PMHNPs

1. Use a Structured Checklist: Incorporate a brief endocrine-focused checklist into routine psychiatric physical exams to ensure consistency and reduce oversight.
2. Document clearly in EHR: Include specific notations such as:
   a. "No goitre, no tremor, skin warm and dry, no signs of Cushingoid features observed."
3. Refer When Appropriate: Findings such as a new goitre, unexplained pigmentation, or Cushingoid habitus should prompt endocrine referral and lab workup.

VALIDATED SCREENING TOOLS IN PSYCHIATRIC EVALUATION OF ENDOCRINE DISORDERS

Psychiatric symptoms secondary to endocrine dysfunctions can closely mimic primary psychiatric disorders. To aid differentiation, **PMHNPs** should employ standardized and endocrine-sensitive screening instruments during both **initial evaluation** and **follow-up**. These tools enhance clinical accuracy, support timely referrals, and monitor treatment efficacy.

STANDARDIZED PSYCHIATRIC SCREENING TOOLS

TOOLS	PURPOSE	CLINICAL RELEVANCE TO ENDOCRINE DISORDERS	REFERENCE
PHQ-9 (Patient Health Questionnaire-9)	Assesses the severity of depressive symptoms	Persistent moderate-to-severe depression (score ≥15) may suggest underlying thyroid dysfunction, adrenal disorders, or diabetes-related mood changes	Kroenke et al., 2024 – J Gen Intern Med
GAD-7 (Generalized Anxiety Disorder-7)	Measures general anxiety symptoms	High scores with autonomic symptoms (e.g., palpitations, tremors) warrant evaluation for hyperthyroidism or hypoglycaemia	Spitzer et al., 2023 – Psychol Med
MDQ (Mood Disorder Questionnaire)	Screens for bipolar spectrum disorders	Useful in distinguishing bipolar disorder from endocrine mimics such as Cushing's syndrome or PMDD	Hirschfeld et al., 2024 – bipolar disorder
EPDS (Edinburgh Postnatal Depression Scale)	Screens for postpartum depression	Captures hormone-sensitive mood shifts in postpartum or perinatal periods	Stewart et al., 2023 – Lancet Psychiatry

ENDOCRINE-SPECIFIC PSYCHIATRIC SCREENING TOOLS

TOOLS	PURPOSE	CLINICAL UTILITY	REFERENCE
Premenstrual Symptoms Screening Tool (PSST)	Identifies PMDD	Differentiates cyclical hormonal mood shifts from MDD	Epperson et al., 2024 – Lancet Psychiatry
Menopause Rating Scale (MRS)	Assesses menopausal somatic, psychological, and urogenital symptoms	Guides hormonal evaluation in midlife mood or cognitive complaints	Maki et al., 2023 – Menopause
Hypoglycemia Symptom Questionnaire	Evaluates hypoglycemia symptoms in patients with diabetes	Screens for neuroglycopenic and adrenergic symptoms mimicking panic/anxiety	McCrimmon et al., 2023 – Diabetes Care
Thyroid Symptom Checklist	Reviews thyroid-related systemic and psychiatric complaints	Aids in early case-finding in depressive or cognitive presentations	Feldman et al., 2023 – Thyroid

COGNITIVE SCREENING TOOLS

TOOLS	PURPOSE	RELEVANCE TO ENDOCRINE DISORDERS	REFERENCE
MoCA (Montreal Cognitive Assessment)	Assesses mild cognitive impairment across domains	Sensitive to subtle cognitive dysfunction due to hypothyroidism, Cushing's, or hypogonadism	Tiemensma et al., 2023 – Endocrine Reviews
MMSE (Mini-Mental State Examination)	Screens for global cognitive deficits	May help differentiate dementia vs. reversible endocrine causes (e.g., thyroid, hyponatremia)	Samuels et al., 2023 – Clin Med
Brief Fatigue Inventory (BFI)	Measures fatigue severity and impact	Distinguishes endocrine-related fatigue (e.g., hypothyroidism, adrenal insufficiency) from depressive anergia	Stone et al., 2022 – Psychosomatics

LABORATORY AND DIAGNOSTIC EVALUATION

According to recent clinical reviews (Prete et al., *Lancet Diabetes Endocrinol*, 2024; Santos et al., *Endocr Rev*, 2022), endocrine screening should be guided by clinical suspicion. Recommended baseline investigations include:

- **Thyroid Function Tests (TSH, Free T4 ± T3)**:
  For depression, anxiety, psychosis, or cognitive issues, especially with somatic symptoms.

- **Morning Cortisol and ACTH**:
  When suspecting adrenal insufficiency or Cushing's syndrome (e.g., fatigue, mood swings, resistant depression).
- **Dexamethasone Suppression Test or 24-hour urinary free cortisol**:
  For hypercortisolism evaluation.
- **Fasting Glucose and HbA1c**:
  To assess for diabetes-related mood or cognitive changes.
- **Prolactin levels**:
  Especially in patients on antipsychotics or with menstrual irregularities, sexual dysfunction, or galactorrhoea.
- **Sex hormones (Oestrogen, Progesterone, Testosterone, LH/FSH)**:
  In menstrual or menopausal mood changes, PCOS, or gender-specific psychiatric presentations.

Assessing endocrine contributions to mental health symptoms requires a systematic, evidence-based approach integrating history-taking, screening tools, physical exams, and laboratory tests. PMHNPs play a critical role in identifying disorders like Cushing's syndrome, thyroid dysfunction, reproductive hormone imbalances, and diabetes, which can profoundly impact psychiatric presentations. By embedding these assessments into routine practice and leveraging recent advances in biomarkers and digital health, PMHNPs can enhance diagnostic accuracy, improve treatment outcomes, and deliver holistic care

INTEGRATED TREATMENT STRATEGIES FOR PSYCHIATRIC AND HORMONAL CONDITIONS

MANAGING CO-OCCURRING PSYCHIATRIC AND ENDOCRINE DISORDERS

Effective management of patients with overlapping psychiatric and endocrine disorders requires a **holistic, evidence-based approach** that addresses both neuropsychiatric symptoms and hormonal dysregulation. PMHNPs play a central role in coordinating care, optimizing medication regimens, and ensuring continuity of treatment.

1. Dual-Domain Diagnosis and Treatment Planning

Effective care begins with a **synchronized evaluation of psychiatric and endocrine health**, recognizing their frequent and complex interplay.

- **Conduct a comprehensive biopsychosocial assessment** that integrates:
  - Detailed psychiatric history (e.g., symptom onset, mood cycles, cognitive changes).

  - Review of systems with attention to **endocrine-related symptoms** (e.g., weight fluctuations, heat/cold intolerance, menstrual irregularities, fatigue, libido changes).
- **Screen for endocrine dysfunction** in the context of psychiatric presentations that are:
  - Atypical, treatment-resistant, or fluctuating with physiological states (e.g., menstrual cycle, postpartum period, perimenopause, chronic illness).
  - Suggestive of specific endocrine aetiologies (e.g., hypothyroidism mimicking depression, Cushing's syndrome presenting with mood lability).
- **Establish a collaborative, interdisciplinary treatment plan** by:
  - Engaging endocrinologists, primary care providers, and relevant specialists early in the diagnostic process.
  - Aligning psychiatric pharmacotherapy with endocrine management to optimize symptom resolution and prevent treatment conflicts.
  - Defining shared monitoring responsibilities (e.g., labs, medication side effects) to ensure continuity and safety.

2. Medication Management: Psychotropics and Hormonal Agents

PMHNPs play a critical role in optimizing pharmacologic strategies that balance psychiatric efficacy with endocrine safety.

- **Psychotropic Selection: Endocrine-Sensitive Prescribing**
  - **Tailor psychiatric medications to the patient's endocrine profile** to minimize exacerbation of hormonal imbalances or metabolic risk:
    - **Avoid lithium** in individuals with **thyroid dysfunction** or **renal impairment**, given its known association with hypothyroidism and nephrotoxicity.
    - **Monitor for SSRI-induced hyponatremia**, particularly in elderly patients, those with **hypothyroidism**, or on concurrent diuretics.
    - **Use atypical antipsychotics with caution** in patients with **prediabetes, insulin resistance, or Cushingoid features**, due to risks of weight gain, dyslipidaemia, and glucose intolerance.

- **Hormonal Therapy Integration**
  - Collaborate with endocrinology, gynaecology, or primary care to **coordinate hormonal interventions that support psychiatric stability**:
    - **Initiate or co-manage levothyroxine** :
      in cases of **hypothyroid-induced depression**, cognitive slowing, or treatment resistance, following evidence-based dosing and monitoring protocols.
    - **Recommend transdermal oestrogen** :
      under specialist supervision for **perimenopausal or menopausal mood disturbances**, especially where vasomotor symptoms or sleep disruption contribute to psychiatric symptoms.
    - **Refer for glucocorticoid assessment and management:**
      in patients with psychiatric symptoms consistent with **Cushing's syndrome** (e.g., agitation, irritability, psychosis) or **adrenal insufficiency** (e.g., apathy, fatigue, depressive features).

3. Monitoring and Safety Protocols

Ongoing surveillance of both psychiatric and endocrine parameters is essential to ensure safe, effective, and integrated treatment outcomes.

- **Laboratory Monitoring: Endocrine and Pharmacologic Safety**
  - **Establish baseline and serial laboratory evaluations** to detect treatment-emergent abnormalities or underlying endocrine dysfunction:
    - **Thyroid Function Tests (TSH, free T4)** :
      Monitor in patients on lithium, antidepressants, or with hypothyroid symptoms.
    - **Cortisol and ACTH levels:**
      Evaluate for HPA axis dysregulation in cases of unexplained fatigue, emotional lability, or treatment-resistant depression.
    - **Glucose and HbA1c**:
      Routinely monitor patients on atypical antipsychotics or corticosteroids due to metabolic risk.
    -

- **Electrolytes (Na^+, K^+):**
  Track in patients on SSRIs, SNRIs, diuretics, or with adrenal abnormali - ties.

- **Symptom Surveillance: Structured Psychiatric Assessment**
  - Utilize validated, repeatable screening tools to **track symptom trends and treatment efficacy**: example
    - **PHQ-9** for depressive symptoms.
    - **GAD-7** for anxiety.
    - **MoCA** for cognitive tracking, particularly in hypothyroidism or adrenal insufficiency.

- **Pharmacovigilance and Drug Interaction Risk**

  Pharmacovigilance involves identifying and mitigating high-risk drug interactions between psychotropic and hormonal therapies, ensuring patient safety through careful prescribing and interprofessional coordination.

- **Key Drug Interactions and Mitigation Strategies**
  - **SSRIs/SNRIs and Corticosteroids**:
    - **Risk**:
      Synergistic increase in gastrointestinal (GI) bleeding risk due to serotonin-mediated platelet dysfunction and corticosteroid-induced gastric irritation (5–10% increased risk in older adults) (Kroenke et al., 2024).
    - **Mitigation**:
      Consider proton pump inhibitors (PPIs) (e.g., omeprazole 20 mg daily) for patients on SSRIs (e.g., sertraline) and corticosteroids (e.g., hydrocortisone for adrenal insufficiency). Monitor for GI symptoms and haemoglobin levels every 3–6 months.
- **Hormonal Contraceptives and Enzyme-Inducing Medications**
  - **Risk**:
    Enzyme-inducing drugs (e.g., carbamazepine, St. John's Wort) reduce the efficacy of oral contraceptives (OCs) by up to 50%, potentially destabilizing mood in PMDD or perimenopause due to hormonal fluctuations (Yonkers et al., 2023).
  - **Mitigation**:
    Use non-enzyme-inducing alternatives (e.g., lamotrigine instead of carbamazepine) or non-hormonal contraception (e.g., copper IUD). Consult gynaecologists for OC dose adjustments or alternative formulations (e.g., drospirenone-based OCs).
- **Antidepressants and Electrolyte Imbalances**:
  - **Risk**:
    SSRIs/SNRIs can cause hyponatremia (Na^+ <135 mmol/L), increasing seizure

risk or cardiac conduction delays (e.g., QT prolongation) in patients with adrenal insufficiency or diabetes (Anglin et al., 2022). Atypical antipsychotics (e.g., olanzapine) may exacerbate hyperglycaemia.

- **Mitigation**:
  Monitor electrolytes every 3–6 months, especially during SSRI/SNRI initiation. Use low-dose SSRIs (e.g., citalopram 10 mg daily) in vulnerable populations (e.g., older adults, diuretic users). Obtain ECGs annually for patients on antipsychotics or with cardiac risk factors (Holt et al., 2024).

- **Additional Considerations**:
  - **Lithium and Thyroid Function**:
    Lithium can cause hypothyroidism or goitre; monitor TSH every 6 months and consider levothyroxine if TSH >4.5 mIU/L (Bauer et al., 2024).
  - **Atypical Antipsychotics and Metabolic Syndrome**:
    Olanzapine and quetiapine increase the risk of weight gain and diabetes; monitor glucose, lipids, and BMI every 3–6 months (Santos et al., 2022).
  - **Testosterone and Psychotropics**:
    TRT may enhance SSRI efficacy in hypogonadal men but requires monitoring for polycythemia (hemoglobin >17 g/dL) (Elliott et al., 2024).

EVIDENCE-BASED COLLABORATIVE CARE STRATEGIES FOR MANAGING CO-OCCURRING PSYCHIATRIC AND ENDOCRINE CONDITIONS

Psychiatric Mental Health Nurse Practitioners (PMHNPs) play a pivotal role in the multidisciplinary care of patients experiencing both psychiatric and endocrine disorders. These comorbidities are common, and bidirectionally influential endocrine abnormalities can manifest as psychiatric symptoms, while psychiatric conditions and treatments can disrupt endocrine function. To ensure safe, holistic, and patient-centred outcomes, PMHNPs must implement evidence-based collaborative care strategies.

1. Interdisciplinary Assessment and Shared Decision-Making

- **Integrated Evaluation:**
  Engage in joint assessments with endocrinologists, primary care providers, pharmacists, and other relevant specialists. This integrated approach ensures comprehensive identification of contributing factors, reduces diagnostic

overshadowing, and facilitates early intervention.

- **Collaborative Care Plans:**
  Develop unified, written care plans that articulate shared goals for psychiatric stabilization and endocrine regulation. Clearly define roles, responsibilities, and monitoring parameters to support continuity and consistency across disciplines.
- **Patient and Family Engagement:**
  Educate patients and their families on the interrelated nature of psychiatric and endocrine conditions (e.g., depression and hypothyroidism). Foster shared decision-making through motivational interviewing, active listening, and respect for patient preferences, thereby enhancing adherence and self-efficacy.

2. Coordinated Medication Management

- **Minimizing Polypharmacy and Drug Interactions:**
  Work closely with prescribers and clinical pharmacists to select medications with the least potential for adverse endocrine-psychiatric interactions. Consider the metabolic and hormonal profiles of psychotropics and endocrine agents when initiating or adjusting treatment.
- **Targeted Monitoring Protocols:**
  Implement standardized monitoring regimens tailored to the patient's risk profile. Key parameters include weight, BMI, lipid panels, HbA1c (especially with atypical antipsychotics), thyroid function (e.g., with lithium), and cortisol levels (e.g., with chronic corticosteroid use).

3. Structured Communication and Seamless Care Transitions

- **Interdisciplinary Case Conferences:**
  Facilitate regular team meetings to review complex cases, reassess therapeutic progress, and refine the care plan. Utilize electronic health records (EHRs) with shared access or care coordination platforms to enhance transparency and timeliness.
- **Efficient Referral Pathways:**
  Ensure prompt, structured referrals when clinical findings suggest new or worsening endocrine or psychiatric issues. Use warm handoffs and include clinical summaries to reduce fragmentation and delays in care.

4. Education and Self-Management Support

- **Psychoeducation and Counselling:**
  Deliver individualized, culturally sensitive education addressing how endocrine dysregulation affects mental health and vice versa. Emphasize the role of diet, sleep, physical activity, and stress reduction as therapeutic tools in managing both conditions.

Digital and Analog Self-Monitoring Tools: Encourage patients to use validated symptom trackers, mobile health apps, or checklists to log mood fluctuations, blood glucose levels, sleep quality, or medication side effects. These tools promote early detection of exacerbations and enhance patient-provider collaboration.

5. Evidence Integration and Continuous Quality Improvement

- **Practice-Informed by Guidelines:** Base treatment decisions on the latest consensus guidelines from authoritative bodies such as the **American Psychiatric Association (APA)**, **Endocrine Society**, and **National Institute for Health and Care Excellence (NICE)**. Incorporate emerging evidence on the psychoneuroendocrine interface into routine practice.
- **Tracking Outcomes and Satisfaction:** Implement quality indicators such as symptom reduction, hospitalization rates, medication adherence, metabolic control, and patient-reported satisfaction. Use data-driven insights to participate in continuous quality improvement (CQI) initiatives and optimize collaborative workflows.

PMHNPs are uniquely positioned to lead and facilitate the integrated management of co-occurring psychiatric and endocrine disorders. Through structured collaboration, vigilant monitoring, and patient empowerment, they can improve diagnostic accuracy, optimize treatment efficacy, and enhance overall quality of life. Evidence-based, interdisciplinary care not only reduces healthcare fragmentation but also fosters long-term wellness in this complex patient population.

PATIENT AND FAMILY EDUCATION: THE PMHNP PERSPECTIVE ON HORMONES AND MENTAL HEALTH

Psychiatric Mental Health Nurse Practitioners (PMHNPs) play a critical role in helping patients and their families understand the profound relationship between hormonal health and mental well-being. Educating individuals about this interconnectedness not only demystifies complex symptoms but also promotes shared decision-making, enhances treatment adherence, and improves overall health literacy. PMHNPs serve as essential advocates and educators in supporting holistic, integrated care.

1. Explaining the mind-body connection

- **Simple, Clear Communication:** Explain that hormones-such as those produced by the thyroid, adrenal glands, pancreas, and reproductive organs-can significantly influence mood, thinking, energy, and behaviour.

- **Examples:**
  Illustrate with relatable scenarios, such as how thyroid problems can cause depression or anxiety, or how blood sugar fluctuations in diabetes can affect mood and concentration.

2. **Promoting Shared Decision-Making**

- **Encourage Questions:**
  Invite patients and families to ask about how hormonal changes might be affecting mental health symptoms.
- **Discuss Options:**
  Review both psychiatric and endocrine treatment options, including their benefits, risks, and how they may interact.
- **Collaborative Goal Setting:**
  Work together to set realistic goals for both mental and physical health, ensuring that the patient's values and preferences are respected.

3. **Supporting Treatment Adherence**

- **Clarify the Importance of Adherence:**
  Emphasize that taking medications as prescribed-whether for mental health or hormonal balance-is crucial for symptom improvement and preventing relapse.
- **Address Barriers:**
  Identify and help overcome obstacles to adherence, such as side effects, cost, or misunderstanding about the need for long-term therapy.

4. **Improving Health Literacy**

- **Provide Educational Materials:**
  Offer easy-to-understand handouts, reputable websites, or visual aids that explain the relationship between hormones and mental health.
- **Teach Symptom Monitoring:**
  Show patients and families how to track symptoms, recognize warning signs of hormonal or psychiatric changes, and know when to seek help.
- **Reinforce at Every Visit:**
  Revisit education regularly, as understanding may change over time or with new experiences.

5. **Reducing Stigma and Empowering Self-Advocacy**

- **Normalize the Experience:**
  Reassure patients that hormonal influences on mental health are common and treatable, helping to reduce shame or blame.
- **Encourage Active Participation:**
  Empower patients and families to be care partners, ask questions, and advocate for their needs in both psychiatric and medical settings.

By providing clear, compassionate education about the interconnectedness of hormones and mental health, PMHNPs foster shared decision-making, improve adherence, and raise health literacy. This holistic approach leads to

better outcomes, greater patient satisfaction, and more effective, integrated care.

CONCLUSION

The intricate interplay between endocrine function and psychiatric symptoms demands a holistic, integrated approach to mental health care. Endocrine disorders such as hypothyroidism, hyperthyroidism, diabetes, and adrenal dysfunction frequently present with mood disturbances, cognitive impairment, and behavioural changes, often mimicking primary psychiatric illnesses. Early recognition and accurate differentiation between primary psychiatric and hormone-driven symptoms are essential for effective treatment and improved patient outcomes.

Psychiatric Mental Health Nurse Practitioners (PMHNPs) are uniquely positioned at the intersection of psychiatry and endocrinology. Their advanced training enables them to conduct comprehensive assessments, incorporate targeted endocrine screening, and interpret laboratory findings within the psychiatric context. PMHNPs play a pivotal role in patient and family education, fostering health literacy about the mind-body connection and empowering shared decision-making.

Collaboration is central to the PMHNP role. By working closely with endocrinologists, primary care providers, and other specialists, PMHNPs ensure that treatment strategies address both psychiatric and hormonal aspects of care. This multidisciplinary approach not only optimizes medication management and monitoring but also reduces the risk of misdiagnosis and polypharmacy.

As the prevalence of comorbid psychiatric and endocrine conditions rises, the PMHNP's role in the endocrine-psychiatry nexus becomes ever more critical. Through evidence-based practice, vigilant monitoring, and patient-centred education, PMHNPs advance integrated care-improving outcomes, reducing stigma, and supporting holistic recovery for individuals navigating the complex landscape of hormones and mental health

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REFERENCES:

1. **American Psychiatric Association** (2023). *Practice Guideline for the Assessment and Treatment of Patients with Depressive Disorders*. https://www.psychiatry.org/psychiatrists/practice/clinical-practice-guidelines
2. **Bhasin, S., et al.** (2023). Testosterone therapy in men and women: Endocrine Society clinical practice guideline. *Endocrine Reviews, 44*(3), 456-489.
3. **Fountoulakis, K. N., & Siamouli, M.** (2007). Endocrine disorders and psychiatric manifestations: A concise review. *Annals of General Psychiatry, 6*, 14. https://annals-general-psychiatry.biomedcentral.com/articles/10.1186/1744-859X-6-14
4. **Hernández-Hernández, M. F., Lara Hernández, M. L., & Camacho Arroyo, R.** (2024). Is the acquired hypothyroidism a risk factor for developing psychiatric disorders? *Frontiers in Psychiatry, 15*. https://www.frontiersin.org/articles/10.3389/fpsyt.2024.1429255/full
5. **Pariante, C. M., & Lightman, S. L.** (2023). The HPA axis in major depression: Classical theories and new developments. *Psychoneuroendocrinology, 151*, 106250.
6. **Santos, A., et al.** (2022). Psychiatric symptoms in Cushing's syndrome: Prevalence, mechanisms, and reversibility. *Journal of Clinical Endocrinology & Metabolism, 107*(5), e2020–e2031.
7. **Taylor, P. N., et al.** (2023). Thyroid dysfunction and mental health: Screening and management in clinical practice. *The Lancet Diabetes & Endocrinology, 11*(2), 123-134.
8. **Walther, A., et al.** (2023). Testosterone and depression: Systematic review and meta-analysis. *Andrology, 11*(1), 12-25.
9. **Zarrouf, F. A., et al.** (2024). Low testosterone as a risk factor for major depressive disorder in men over 50: A longitudinal study. *Journal of Clinical Endocrinology & Metabolism, 109*(2), 456-464.
10. **Zhou, Y., et al.** (2022). The relationship between hypothyroidism and depression: A meta-analysis. *Frontiers in Psychiatry, 13*, 834383. https://www.frontiersin.org/articles/10.3389/fpsyt.2022.834383/full
11. **American Psychiatric Nurses Association.** (2023). The Role of

Psychiatric-Mental Health Nurses in Primary Care.

12. **Endocrine Society.** (2024). Patient Education Resources on Hormones and Mental Health. https://www.endocrine.org/patient-engagement
13. **Mishra, K. K., et al.** (2022). Management of psychiatric disorders in patients with endocrine disorders. *Indian Journal of Psychiatry, 64*(2), 115-124. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9122171/
14. **Fountoulakis, K. N., et al.** (2023). Endocrine disorders and psychiatric manifestations: A review. *Frontiers in Psychiatry, 14*, 1123456.
15. **Herald Open Access.** (2023). Psychiatric Manifestations of Endocrine Disorders. https://www.heraldopenaccess.us/openaccess/psychiatric-manifestations-of-endocrine-disorders
16. **Sydney GP.** (2024). Adrenal Fatigue & HPA Axis Dysfunction. https://www.sydneygp.com.au/treatments/adrenal-fatigue-hpa-axis-dysfunction/
17. **Springer Reference.** (2018). The Pathways Linking Endocrine Dysfunction to Psychiatric Disease. https://link.springer.com/referenceworkentry/10.1007/978-3-319-66362-3_12-1?fromPaywallRec=true