ESSENTIALS OF HORMONE THERAPY FOR ANTI-AGING

CBAM Aesthstic Mastery Series



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Dr. Akef is dedicated to understanding his clients' concerns and creating personalized treatment plans that meet their needs and goals. He is committed to thoughtfully and strategically creating individualized combinations of leading, safe treatments that exceed client expectations. He is also the founder of Angel Gloss spa in Toronto, an established, leading destination for non-surgical cosmetic procedures for individuals seeking leading physicians with proven experience, the latest technology, and cutting-edge techniques.

Dr. Akef is actively involved in multiple training courses, webinars, and conferences all around the world, including prestigious international conferences such as IMCAS, AMWC, and Dubai Derma. He participates as a speaker at these events and is always looking to stay up to date with the latest developments in the field of cosmetic medicine.

Mohsen Talani is the Director of CBAM. He has over 18 years of experience teaching anatomy in Canada and internationally to students and healthcare practitioners in different fields of medicine such as physicians, dentists, nurses, chiropractors, and physiotherapists.

After graduating from medical school at a young age, he became a medical doctor in his home country, Iran, and practiced in the field of emergency medicine. While pursuing his Master's thesis in neuroscience at McGill University, he discovered his passion for teaching. Since then, he has been working in the field of medical science education, with a focus on anatomy.

He strongly believes that with the rapidly growing aesthetic industry, all practitioners should have a profound knowledge of skin basics, fat compartments, muscles, blood vessels, and nerves, in order to provide safe and effective care to clients and prevent or minimize post-treatment complications linked to lack of anatomy knowledge.

He is currently training healthcare practitioners who seek to have a deep knowledge of anatomy. He incorporates fun, innovative, and easy-to-understand methods of teaching in all of his classes, guest lectures, and presentations. Additionally, he supervises the cadaver lab dissections and hands-on practicals.



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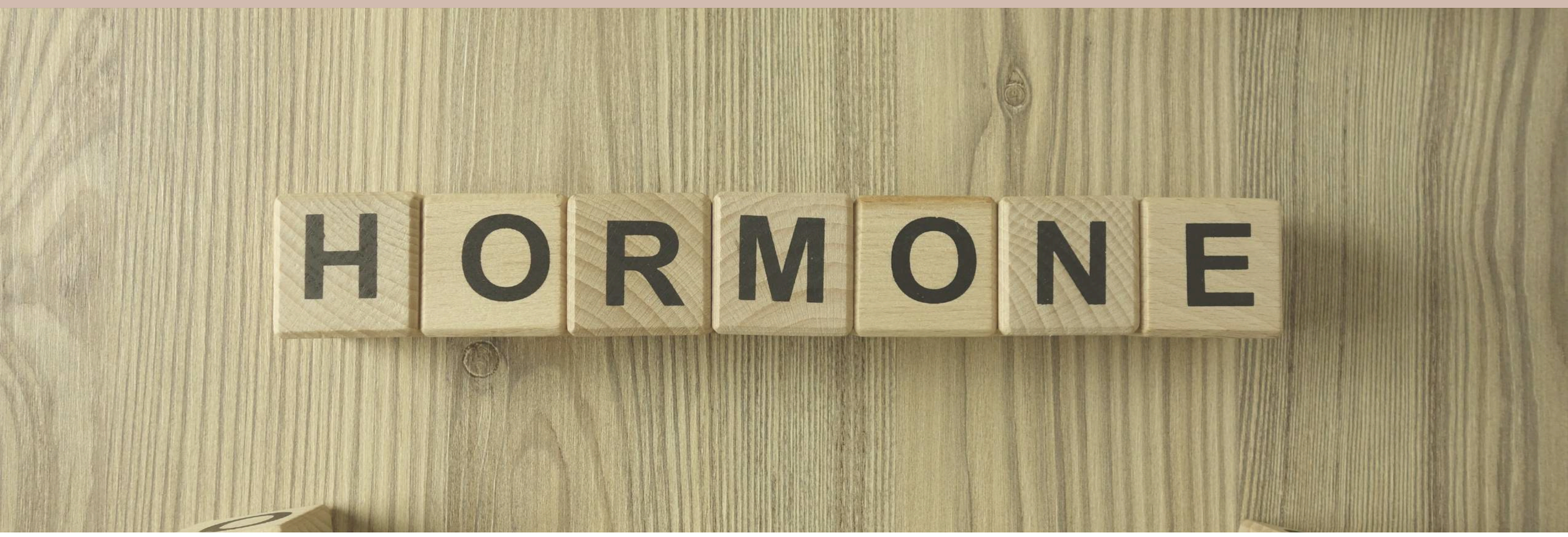
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Preface

Hormone therapy is one of the most discussed and, at times, one of the most misunderstood areas in modern aesthetic and anti-aging medicine. In daily practice, clinicians increasingly meet patients who are not only concerned about wrinkles, skin quality, hair thinning, or body composition, but also about fatigue, poor sleep, low libido, reduced vitality, mood changes, and the sense that they no longer feel like themselves. Very often, these concerns exist together. The patient who asks about facial aging may also be struggling with hormonal symptoms. The patient seeking better energy or sexual wellness may also be worried about visible aging. This overlap is what makes the study of hormones so relevant to aesthetic medicine.

At the same time, hormone therapy must be approached with caution and clinical maturity. It is not a beauty treatment, not a shortcut to youth, and not a casual intervention. Hormones affect multiple organ systems and influence sleep, metabolism, mood, body composition, sexual health, skin quality, and tissue function. Because of this, any attempt to use hormone-based treatment without proper assessment, scientific reasoning, and careful monitoring can lead to inappropriate prescribing, unrealistic expectations, and patient harm.

This book was written to provide a practical and clinically grounded guide for practitioners who want to understand hormone therapy within the setting of aesthetic and anti-aging medicine. It is designed for readers who want more than simplified wellness language and more than fragmented online information. The aim is to present hormone therapy in a structured way that connects physiology, patient assessment, symptom interpretation, treatment planning, and clinical responsibility.

The purpose of this book is not to encourage overuse of hormones or to present hormone therapy as the answer to every complaint associated with aging. Instead, it is meant to help clinicians understand where hormone-related interventions may have value, where caution is necessary, and where non-hormonal approaches or specialist referral may be more appropriate. In this way, the book reflects a practical medical mindset: identify the problem clearly, assess the patient carefully, treat only when justified, and monitor responsibly.

Because this book is intended for use in clinical and educational settings, special attention is given to practicality. The treatment-oriented sections are designed to be easier to use, with concise clinical frameworks, quick-reference tables, and structured summaries that support day-to-day practice. The goal is for the reader not only to understand the concepts, but also to be able to return to the material efficiently when evaluating patients or reviewing treatment principles.

Hormone therapy can be valuable when used in the right patient, for the right reason, and with the right level of care. It can also be misused when applied too broadly, too aggressively, or without a clear indication.

This book was created to support the first approach and help clinicians avoid the second. If it succeeds, it will not simply teach hormones. It will support safer judgment, clearer communication, and more thoughtful patient care.

How to Use This Book

This book is organized to move from basic understanding to clinical application in a practical sequence. The early chapters introduce the role of hormones in aging and aesthetic medicine, helping the reader understand why endocrine health matters in patients who present with concerns related to appearance, vitality, sexual health, sleep, mood, and body composition. These foundational chapters should be read first, because they establish the framework for everything that follows.

The second part of the book focuses on clinical evaluation before treatment. These chapters are especially important because hormone therapy should never begin with medication choice alone. Proper candidate selection, symptom assessment, medical history, laboratory testing, and risk evaluation are the basis of safe and effective practice.

Readers are encouraged to study these chapters carefully, since errors in hormone therapy often begin at the assessment stage rather than in the treatment stage.

The core section of the book presents each major hormone separately. This structure allows the reader to understand each hormone on its own terms, including its physiology, clinical relevance, common presentations, and treatment considerations. Because these chapters are divided by hormone, they can be read in sequence during the first reading of the book and later used individually as reference chapters when needed in practice.

The treatment-related sections are intentionally designed to be faster and easier to use. Rather than reading like a long academic textbook, they are meant to function as a clinical guide. Quick-reference tables, concise frameworks, and practical summaries are included so that readers can more easily review approaches, monitoring concepts, and key treatment principles. These sections should still be used carefully and critically, but they are structured to support real-world clinical use.

The later chapters focus on broader care, including lifestyle factors, aesthetic integration, safety, ethics, and case-based application. These chapters help place hormone therapy into its proper context. Hormone treatment does not replace good medicine, good lifestyle care, or good aesthetic judgment. It should be understood as one part of a larger treatment model.

To get the most benefit from this book, it is helpful to read it in two ways. The first is as a complete educational text, beginning at the front and moving through each section in order. The second is as a clinical reference, returning to specific chapters, tables, and summaries when reviewing patient cases or treatment decisions. Used in this way, the book can serve both as a learning resource and as a practical companion.

This book is not intended to replace specialist training, legal prescribing authority, or individualized clinical judgment. It is meant to support the reader in building a clearer, safer, and more structured understanding of hormone therapy in aesthetic and anti-aging practice.

Scope, Safety, and Clinical Responsibility

Hormone therapy belongs to medical practice, not to trend-based wellness culture. Although it is often discussed in anti-aging settings, it must always be approached as a clinical intervention with potential benefits, limitations, and risks.

For this reason, the scope of hormone therapy in aesthetic medicine is defined not by patient demand or marketing language, but by professional training, legal authority, scientific evidence, and patient safety.

The first responsibility of the clinician is to recognize that hormones should not be prescribed simply because a patient is tired, aging, or seeking rejuvenation. Many common complaints in aesthetic practice, such as low energy, weight change, poor sleep, low mood, reduced libido, skin changes, or hair thinning, are nonspecific. They may be influenced by hormonal shifts, but they may also reflect lifestyle factors, chronic stress, thyroid disease, nutritional deficiencies, psychiatric conditions, medication effects, metabolic problems, or normal aging. A responsible clinician does not reduce every complaint to hormone imbalance.

The second responsibility is to respect the limits of scope. Some practitioners may be trained and licensed to assess, prescribe, and monitor hormone therapy within their jurisdiction. Others may be better positioned to identify possible hormonal concerns, initiate preliminary evaluation where appropriate, and refer or co-manage with endocrinologists, gynecologists, primary care physicians, or other specialists. Knowing when to treat is important. Knowing when not to treat is equally important.



Safety begins with careful patient selection. Before treatment is considered, the clinician must assess whether the patient has a reasonable indication, whether there are contraindications or caution factors, and whether appropriate monitoring can be provided. Treatment without a clear indication, without baseline assessment, or without follow-up planning is not good medicine. Even when hormone therapy is appropriate, it should be individualized rather than formula-based.

Another major part of clinical responsibility is expectation management. Patients in aesthetic practice may hope that hormone therapy will restore youth, reverse aging, or solve multiple long-standing concerns at once. These expectations must be handled honestly. Hormone therapy may improve certain symptoms and may positively influence some aspects of appearance and well-being in selected patients, but it is not a universal anti-aging solution. Ethical practice requires clear communication about what treatment may help, what it may not help, and what risks or trade-offs may be involved.

Monitoring is also part of safe care. Hormone treatment is not static. Patients change, symptoms evolve, risks shift, and responses vary. Follow-up, reassessment, and dose adjustment are part of responsible practice.

A clinician who starts treatment must also be prepared to monitor response, identify adverse effects, and pause, modify, or stop treatment when necessary.

This book is written with these principles in mind. It approaches hormone therapy as a field that requires judgment, precision, humility, and respect for evidence. Wherever treatment is discussed, it should be understood within that framework. The goal is not simply to know what can be prescribed, but to understand when treatment is justified, when it is not, and how to practice in a way that protects the patient.



Key Abbreviations and Laboratory Terms

Because hormone therapy involves repeated use of clinical shorthand, laboratory language, and endocrine terminology, it is useful to define key terms at the beginning of the book. The following abbreviations and laboratory concepts appear frequently in hormone-related discussions and will help the reader navigate the chapters that follow.

ACTH refers to adrenocorticotropic hormone, a pituitary hormone involved in stimulating cortisol production.

CBC stands for complete blood count. It is commonly used to assess parameters such as hemoglobin, hematocrit, white blood cells, and platelets.

CMP refers to comprehensive metabolic panel, which includes markers related to liver function, kidney function, electrolytes, and glucose.

DHEA stands for dehydroepiandrosterone, an adrenal hormone that serves as a precursor to other sex hormones.

DHEA-S refers to dehydroepiandrosterone sulfate, a circulating storage form of DHEA often measured in laboratory testing.

E2 is estradiol, a major estrogen and one of the most clinically relevant female sex hormones.

FSH stands for follicle-stimulating hormone, a pituitary hormone involved in reproductive function and often considered in the evaluation of menopausal status.

FT3 refers to free triiodothyronine, the unbound form of T3.

FT4 refers to free thyroxine, the unbound form of T4.

GH means growth hormone, a pituitary hormone involved in growth, tissue repair, and metabolic regulation.

HbA1c refers to hemoglobin A1c, a marker used to estimate average blood sugar levels over time.

HPA axis means hypothalamic-pituitary-adrenal axis, the regulatory system involved in stress signaling and cortisol balance.

HPG axis means hypothalamic-pituitary-gonadal axis, the system that regulates reproductive hormones.

Key Abbreviations and Laboratory Terms

IGF-1 stands for insulin-like growth factor 1, a hormone associated with growth hormone activity and tissue growth signals.

LH refers to luteinizing hormone, a pituitary hormone involved in gonadal function.

MHT means menopausal hormone therapy.

PRL refers to prolactin, a pituitary hormone that can influence reproductive and sexual function when abnormal.

PSA stands for prostate-specific antigen, a marker sometimes used in male hormone evaluation and monitoring.

SHBG refers to sex hormone-binding globulin, a binding protein that affects the proportion of circulating hormones that are free and active.

T3 means triiodothyronine, an active thyroid hormone.

T4 means thyroxine, the major hormone produced by the thyroid gland.

TSH stands for thyroid-stimulating hormone, one of the most important screening markers in thyroid assessment.

Total testosterone refers to the overall amount of testosterone measured in circulation, including both bound and unbound hormone.

Free testosterone refers to the portion of testosterone not tightly bound to proteins and therefore more biologically available.

Reference range means the expected laboratory range for a given test in a defined population.

Baseline laboratory testing refers to tests performed before treatment begins, providing a starting point for future comparison.

Key Abbreviations and Laboratory Terms

Monitoring labs refers to repeated tests used after treatment begins in order to assess response and safety.

Contraindication means a condition or factor that makes a treatment inappropriate or unsafe.

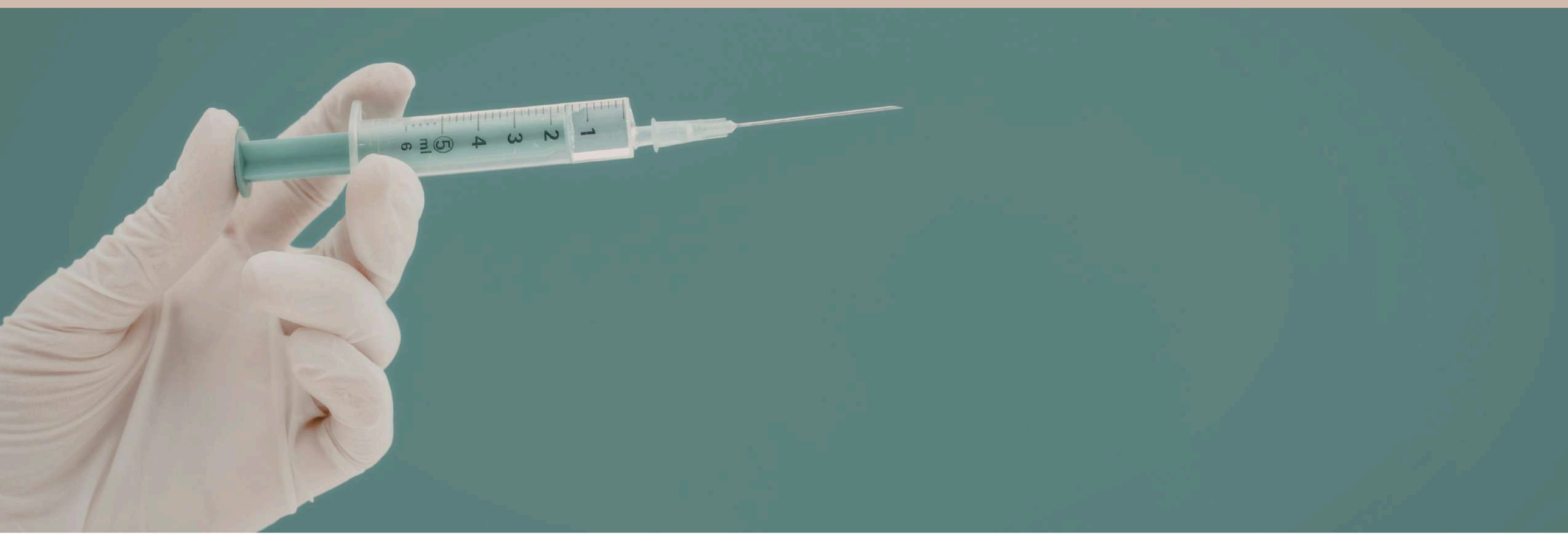
Relative contraindication means a factor that does not absolutely prevent treatment but requires increased caution and individualized judgment.

Titration refers to the gradual adjustment of dose based on response and tolerability.

Physiologic replacement refers to treatment aimed at restoring hormone levels toward a normal biologic range rather than exceeding it.

Supraphysiologic dosing refers to doses above normal physiologic levels, which may increase risk and generally require strong justification, if they are used at all.

These terms provide a common language for the rest of the book. Understanding them early makes the later chapters easier to follow and helps the reader interpret treatment discussions more confidently.



Part I. Foundations

Before exploring individual hormones, treatment options, and clinical protocols, it is essential to build a strong foundation. Hormone therapy cannot be understood properly if it is approached only as a list of medications or laboratory values. In aesthetic and anti-aging medicine, hormones sit at the intersection of physiology, aging, appearance, and patient expectations. Because of this, the clinician must first understand the broader context in which hormone-related care exists.

This section introduces the core concepts that shape the rest of the book. It explains why hormones matter in aging, how endocrine changes can influence visible and functional aspects of health, and why hormone therapy should be viewed as a medical intervention rather than a cosmetic trend. It also helps clarify an important principle: not every age-related complaint is hormonal, and not every patient seeking anti-aging care is a candidate for hormone treatment. The chapters in this part are designed to create the clinical mindset needed for the rest of the book. They establish the difference between hormone therapy and general wellness care, explain how hormonal shifts may affect skin, hair, energy, mood, body composition, and sexual health, and place hormone therapy alongside other anti-aging strategies in a realistic and balanced way.

In practical terms, Part I prepares the reader to think correctly before moving into assessment and treatment. It sets the tone for the book by emphasizing judgment, clarity, and clinical responsibility. Without this foundation, hormone therapy can easily be misunderstood, oversimplified, or misused. With it, the reader is better prepared to approach the following chapters with a safer and more structured perspective.

1



HORMONE THERAPY AND AGING IN AESTHETIC PRACTICE

Hormone therapy has become increasingly relevant in aesthetic and anti-aging medicine because many of the concerns patients bring to clinic sit at the intersection of appearance and physiology. A patient may present asking about dull skin, hair thinning, weight gain, poor sleep, low libido, or reduced vitality, and in some cases these concerns are influenced by endocrine changes rather than surface aging alone. For that reason, hormone therapy deserves a place in aesthetic medicine, but only when it is approached as a medical treatment, not as a trend or cosmetic shortcut.

What Hormone Therapy Is

Hormone therapy is the use of hormones or hormone-related medications to correct a defined deficiency, manage a recognized clinical syndrome, or treat symptoms linked to a documented endocrine change. It is not simply “optimizing” numbers on a lab report or giving hormones to anyone who feels tired or older. In proper medical practice, hormone therapy begins with clinical assessment, symptom review, relevant laboratory testing, and risk evaluation.



In men, testosterone therapy is recommended only when there are symptoms or signs of testosterone deficiency together with unequivocally and consistently low testosterone levels. It is not recommended as routine treatment for healthy men in the general population.

In women, menopausal hormone therapy is first-line for bothersome vasomotor symptoms and is also indicated for genitourinary syndrome of menopause and selected bone-protection indications in appropriate patients.

In thyroid care, hormone treatment usually means replacing a missing hormone, most commonly with levothyroxine in hypothyroidism, with the goal of restoring normal thyroid function rather than producing a cosmetic effect.

So, at its core, hormone therapy is a therapeutic medical intervention designed to restore physiologic balance where a clinically meaningful deficit or indication exists.

Why Hormones Matter in Aging and Aesthetics

Hormones matter in aging because they influence many of the systems that shape how patients look and feel. Skin hydration, collagen support, hair quality, body composition, sleep quality, sexual health, energy, and mood are all affected to some degree by endocrine function. When hormone levels change with menopause, androgen deficiency, thyroid dysfunction, or other endocrine shifts, patients may experience symptoms that overlap with what they describe as “aging.”

This is especially clear in menopause. Hormone therapy remains the most effective treatment for vasomotor symptoms and genitourinary syndrome of menopause, and these symptoms can strongly affect sleep, comfort, sexual well-being, and overall quality of life.

Likewise, hypothyroidism may contribute to fatigue, dry skin, hair thinning, weight gain, and low mood, all of which may be perceived by patients as accelerated aging. Thyroid hormone replacement exists because thyroid hormone is necessary for normal cellular function throughout the body.

In men with true hypogonadism, testosterone deficiency may affect libido, sexual function, vitality, and body composition, which is why testosterone therapy can be appropriate in selected patients.

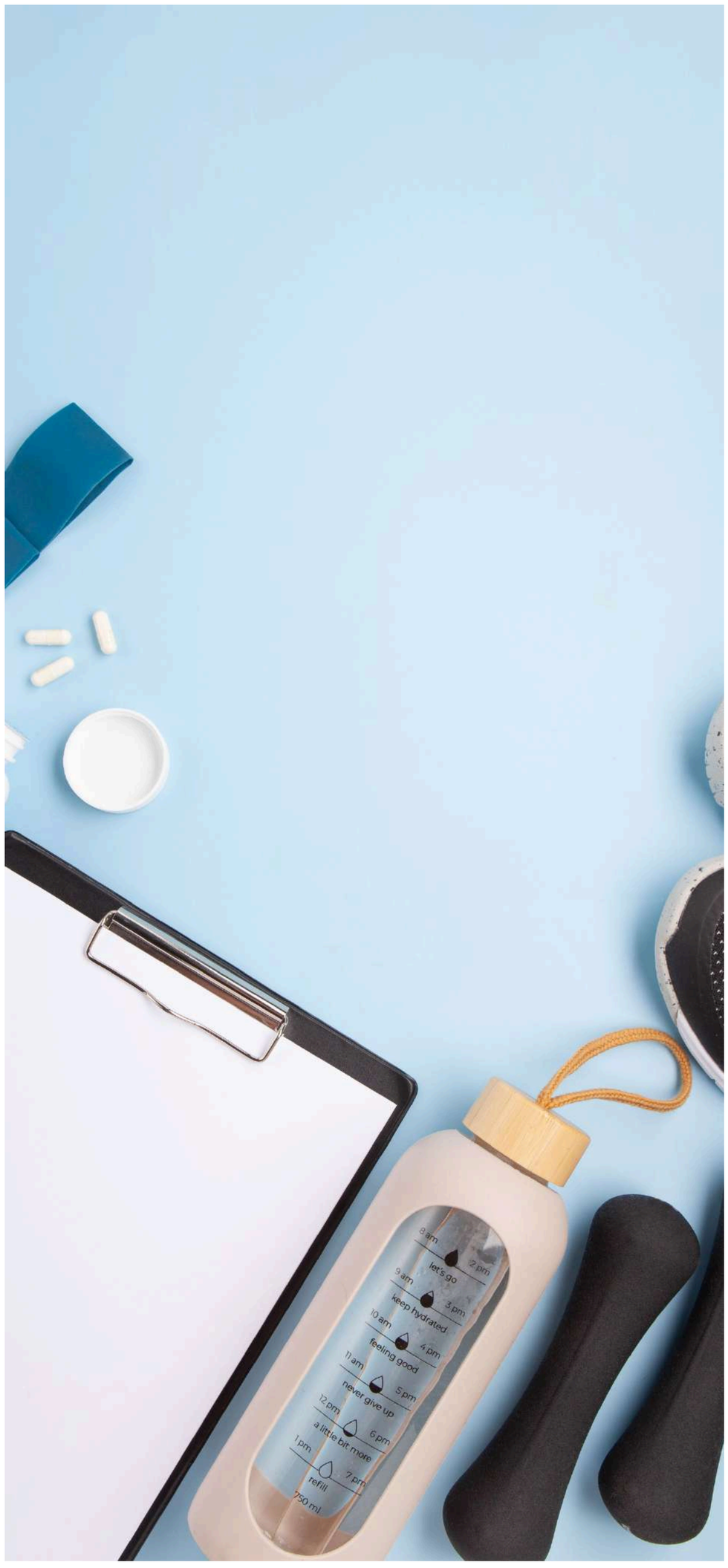
For the aesthetic practitioner, the key point is that visible aging and endocrine health are often connected, but not identical. Hormones can influence appearance, yet they are only one part of the aging picture.

Hormone Therapy Versus General Wellness Interventions

Hormone therapy should never replace the fundamentals of health. Sleep, exercise, nutrition, weight management, stress reduction, and correction of common deficiencies remain foundational. Many symptoms often blamed on hormones, such as fatigue, low motivation, poor recovery, and weight gain, may actually be driven by lifestyle factors, psychosocial stress, sleep problems, metabolic disease, or medication effects rather than true endocrine deficiency.

That is why general wellness interventions usually apply to nearly every patient, while hormone therapy should be selective. The Endocrine Society specifically recommends against routine screening of men in the general population for hypogonadism, which reflects the principle that not every vague symptom should trigger hormone treatment.

A good clinical model is to view lifestyle care as the foundation and hormone therapy as a targeted layer added only when the indication is clear. A patient may need both, but they are not interchangeable. Better sleep and resistance training may improve energy and body composition in many patients, but they do not replace thyroid hormone in true hypothyroidism or menopausal hormone therapy in an appropriate symptomatic menopausal patient.



Hormone Therapy Versus Other Anti-Aging Treatments

Hormone therapy also differs from aesthetic procedures and other anti-aging interventions. Fillers, neuromodulators, lasers, peels, microneedling, and skin treatments act locally or regionally. They improve wrinkles, texture, pigmentation, laxity, or volume loss, but they do not correct endocrine symptoms such as hot flashes, hypothyroid fatigue, or androgen deficiency.

Hormone therapy works at a systemic level. It may improve symptoms that indirectly affect appearance and quality of life, but it does not replace procedural treatment. Menopausal hormone therapy can improve vasomotor symptoms, vaginal comfort, and some broader quality-of-life domains, but it does not replace a device-based treatment plan for photodamage or a filler plan for structural volume loss.

In the same way, thyroid hormone is a replacement treatment for a missing hormone, not a general anti-aging enhancer.

This distinction is important because patients may assume that hormones are a deeper or more powerful version of anti-aging care. In reality, they are simply a different category of treatment, one that should be used only when medically justified.

The Role of Hormone Therapy in Patient Outcomes

When used appropriately, hormone therapy can improve meaningful patient outcomes. In menopausal patients, it can reduce hot flashes, improve sleep, relieve genitourinary symptoms, and improve daily functioning and comfort. In men with confirmed hypogonadism, testosterone therapy may improve symptoms related to sexual function and vitality. In hypothyroidism, thyroid hormone replacement restores deficient hormone levels and supports normal body function.

In aesthetic practice, this matters because patient satisfaction is not determined by appearance alone. A patient who sleeps better, feels more energetic, has less discomfort, or has improved sexual well-being may perceive their health and aging very differently. Hormone therapy can therefore improve outcomes by helping selected patients feel better systemically, which may support better engagement with broader aesthetic and wellness care.

But the role of hormone therapy must stay realistic. It is not a universal anti-aging solution, it does not replace skincare or procedures, and it should not be prescribed simply because a patient wants to “optimize”



aging. Its role is narrower and more medical: to improve clinically relevant symptoms and physiologic deficits in properly selected patients.

Quick Clinical Takeaway

Hormone therapy in aesthetic practice should be understood as a medical tool, not a cosmetic trend. It matters because endocrine function influences many features patients associate with aging, but it should only be used when there is a real indication, appropriate assessment, and a clear follow-up plan. The best outcomes come when hormone therapy is integrated into a broader model of patient care that includes lifestyle, risk assessment, and realistic aesthetic planning.

2



HOW HORMONAL CHANGES AFFECT THE AGING PATIENT

Hormonal change is one of the most important physiologic factors influencing how patients experience aging. In aesthetic and anti-aging practice, patients often present with concerns that seem cosmetic on the surface, such as dull skin, thinning hair, weight gain, low energy, poor sleep, reduced libido, or a more tired appearance. In many cases, these concerns are not caused by hormones alone, but endocrine changes can be an important part of the picture. Understanding this relationship helps the clinician recognize when aging is primarily structural or environmental and when it may also have a hormonal component.



Hormones and the Aging Process

Aging is not a purely external process. It involves gradual changes in tissue repair, metabolic function, body composition, sleep regulation, reproductive function, and stress response. Hormones help regulate all of these systems. As hormone production and hormonal responsiveness change over time, the body may become less efficient in maintaining the physiologic patterns associated with youth, such as stable sleep, strong muscle maintenance, sexual vitality, tissue resilience, and normal skin hydration.

In women, menopause is one of the clearest examples of this process. The National Institute on Aging describes menopause as a normal part of aging and notes that the hormonal changes around this transition can be associated with symptoms such as hot flashes, sleep problems, body composition changes, and skin that becomes thinner and drier.

In men, age-related testosterone decline may influence libido, energy, lean body mass, and aspects of quality of life, although not every older man has pathologic hypogonadism. Endocrine guidance emphasizes that true deficiency should be diagnosed only when symptoms are present together with consistently low testosterone.

So, hormones do not “cause aging” by themselves, but they strongly influence how aging is expressed in the body.

Endocrine Changes Over Time

Hormonal systems change across the lifespan, but the pattern is not identical in every patient. Some endocrine changes are expected physiologic transitions, while others reflect true dysfunction.

In women, ovarian hormone production gradually shifts during perimenopause and then declines substantially with menopause. Estrogen and progesterone changes can affect thermoregulation, sleep, skin quality, body fat distribution, sexual comfort, and mood. The National Institute on Aging notes that during this stage, women may lose muscle, gain fat, experience memory or focus changes, and develop thinner, drier skin.

In men, testosterone may decline gradually with age, but symptoms vary and should not be assumed to represent disease.

Testosterone-related symptoms that are considered more specific include low libido, erectile dysfunction, and reduced morning erections.

Thyroid function is another major factor. Hypothyroidism becomes more common with age and may present with fatigue, dry skin, constipation, depression, cognitive slowing, cold sensitivity, weight gain, and hair loss.

These endocrine shifts matter because they often alter both function and appearance at the same time.

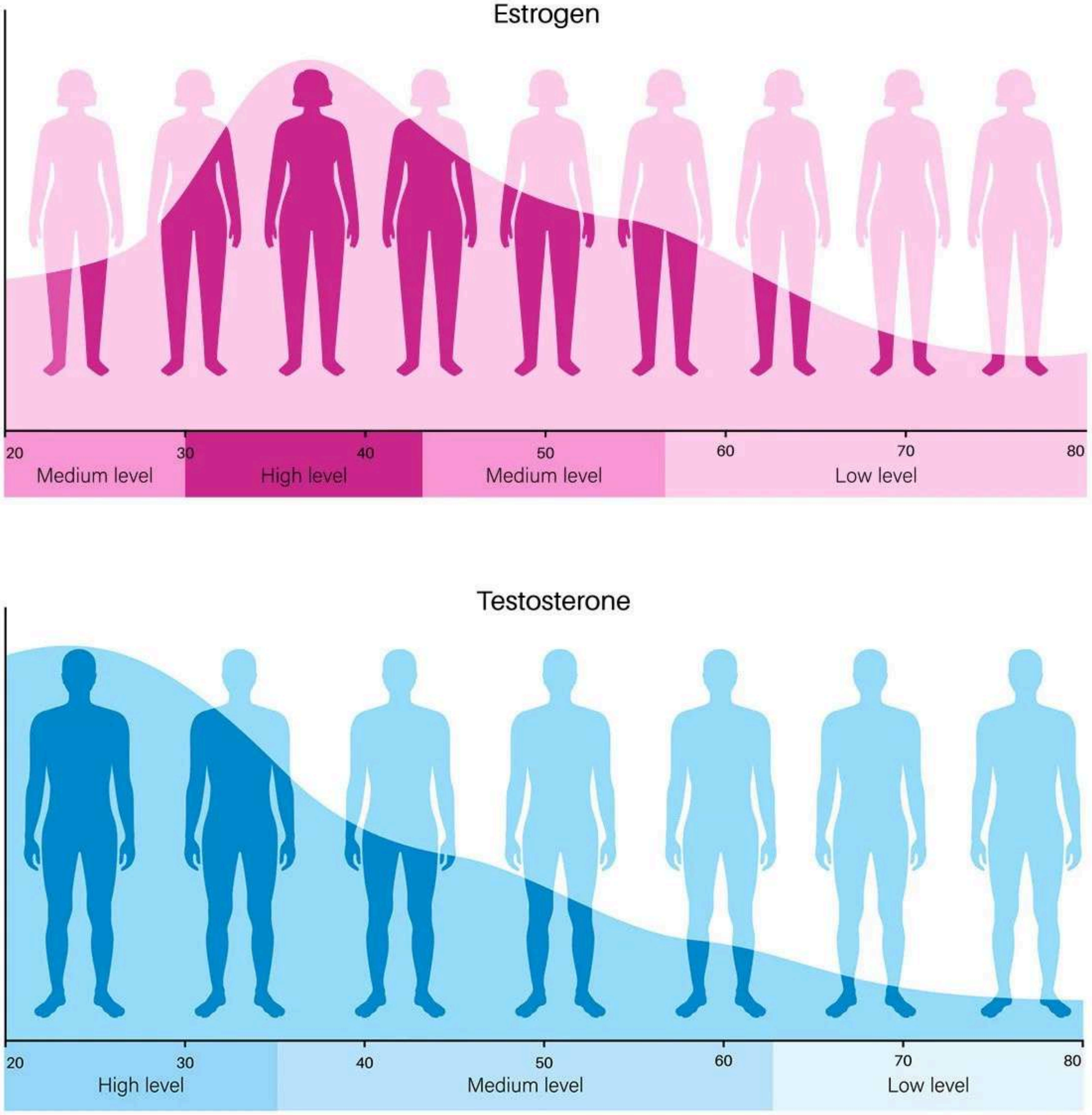
Effects on Skin, Hair, Body Composition, Energy, Mood, and Sexual Health

Hormonal changes affect many of the features patients associate with aging.

Skin is one of the most visible examples. The National Institute on Aging states that age-related loss of collagen and elastin contributes to older-looking skin, and hormonal changes such as menopause can make skin thinner and drier. This means that in some patients, worsening dryness, fragility, and textural change are not only cosmetic issues but also reflections of internal physiologic change.

Hair can also be influenced by hormones. Thyroid dysfunction is a common example, with hypothyroidism associated with dry hair and hair thinning or loss.

SEX HORMONE PRODUCTION BY AGE



Patients may describe this as accelerated aging, but it may be one sign of a broader endocrine problem.

Body composition also changes under hormonal influence. The NIA notes that during the menopause transition, women may lose muscle and gain fat, especially around the waist. Testosterone physiology is also linked to libido, bone mass, fat distribution, muscle mass, and strength. These shifts can make patients feel weaker, less toned, and less resilient, even if their weight alone has not changed dramatically.

Energy and mood are commonly affected as well. Hypothyroidism can produce tiredness, low mood, forgetfulness, and slowing of body functions. Menopause-related hot flashes, night sweats, and mood changes can worsen sleep, which then further affects energy, appearance, and emotional stability.

Sexual health is another major area. Hormonal change may affect libido, arousal, vaginal comfort, erectile function, and overall sexual confidence. The NIA notes that menopause-related vaginal dryness can directly affect sexual comfort. In men, low libido and reduced erectile function are among the symptoms most associated with testosterone deficiency.



The Relationship Between Endocrine Health and Visible Aging

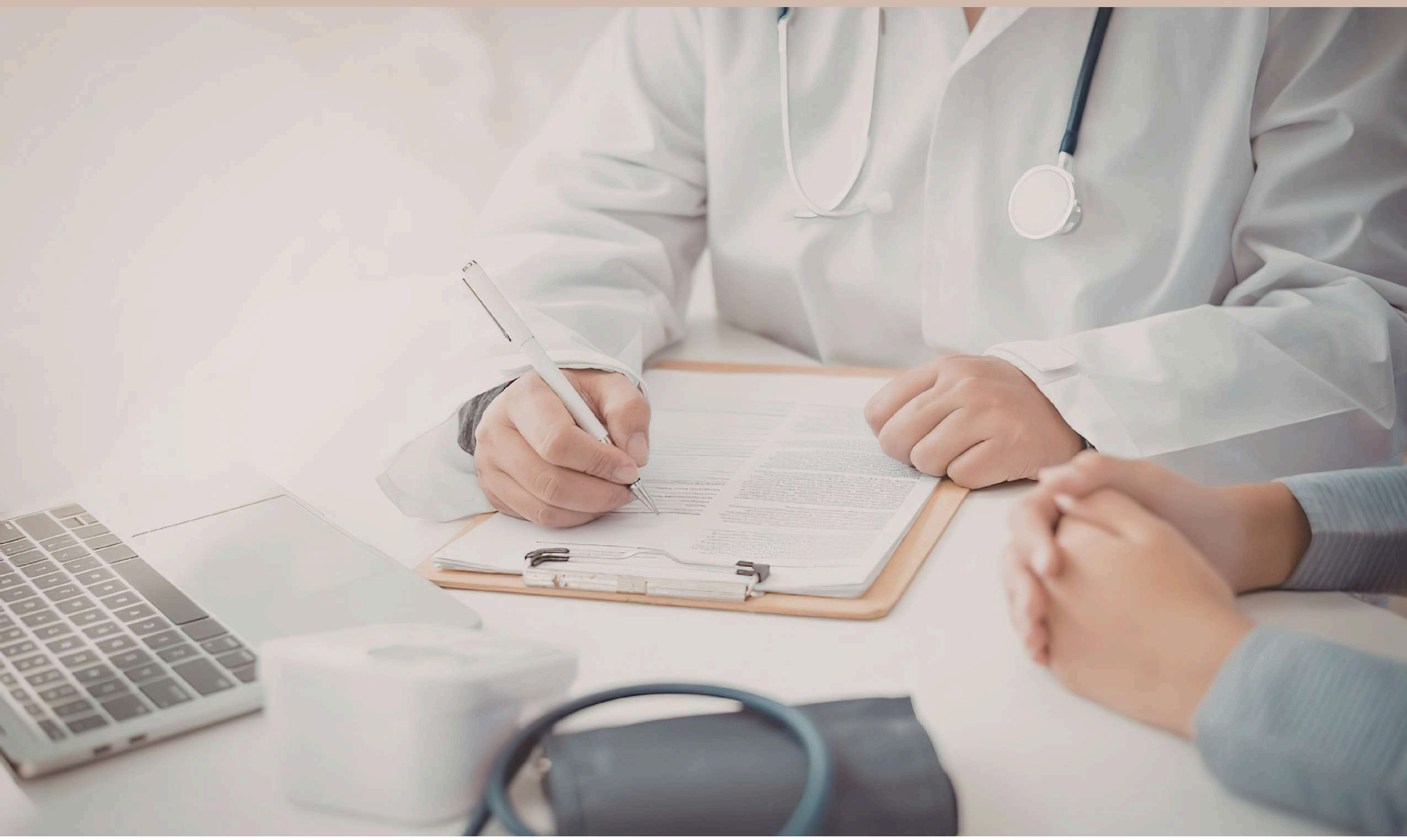
Visible aging is shaped by many factors, including sun exposure, genetics, collagen loss, lifestyle, chronic disease, and endocrine health. Hormonal status is therefore not the only driver of aging appearance, but it can meaningfully modify how aging looks and feels.

For example, a patient with menopause-related skin thinning and poor sleep may appear more aged because of dryness, fatigue, and reduced tissue vitality. A patient with hypothyroidism may look tired, puffy, dry-skinned, and less expressive because metabolic slowing affects both function and appearance. A patient with androgen deficiency may notice reduced muscle tone, lower vitality, and changes in sexual confidence that alter the way they experience aging overall.

This does not mean every visible sign of aging should be medicalized as a hormone problem. Wrinkles, volume loss, and photodamage still require proper aesthetic assessment and often procedural treatment. But it does mean that endocrine health should be considered part of the biologic background of the aging patient.

Quick Clinical Takeaway

Hormonal changes influence aging by affecting tissue quality, body composition, sleep, energy, mood, and sexual health. In aesthetic practice, these changes may shape how patients look, how they feel, and how they respond to treatment. The clinician should therefore understand endocrine health as one important contributor to visible aging, while remembering that it is only one part of a broader clinical picture.



Part II. Clinical Evaluation Before Treatment

Before any hormone is prescribed, the clinician must understand the patient in front of them. In hormone therapy, the quality of treatment depends heavily on the quality of assessment. Many complaints seen in aesthetic and anti-aging practice, such as fatigue, poor sleep, weight change, low libido, hair thinning, dry skin, mood changes, and reduced vitality, can be related to endocrine shifts, but they can also arise from lifestyle, chronic stress, medications, thyroid disease, menopause, psychiatric conditions, or other medical problems.

This is why pre-treatment evaluation is not a formality. It is the foundation of safe care.

This part of the book focuses on how to assess patients before treatment begins. It covers who may be an appropriate candidate, how to take a useful symptom-based history, which elements of past medical history and medication review matter most, and how to interpret hormone-related complaints without jumping too quickly to treatment. It also introduces the practical side of testing and risk screening, because good hormone therapy begins with careful selection, not with a prescription pad.

3



PATIENT ASSESSMENT AND HISTORY TAKING

The first clinical task in hormone therapy is not to decide what to prescribe. It is to decide whether the patient is likely to benefit from further endocrine evaluation at all. Aesthetic patients often present with overlapping concerns: they may want to look younger, feel more energetic, sleep better, improve libido, reduce body fat, or address hair and skin changes. Some of these concerns may relate to real hormonal shifts, while others may not. A careful history helps separate these possibilities and protects both the patient and the clinician from oversimplified treatment decisions.

Identifying Appropriate Candidates

An appropriate candidate is not simply someone who asks for hormones. An appropriate candidate is someone whose symptoms, life stage, medical background, and initial evaluation make endocrine treatment a reasonable possibility. In men, professional guidance recommends diagnosing hypogonadism only when symptoms or signs of testosterone deficiency are present together with unequivocally and consistently low testosterone.



In women, menopausal hormone therapy is used for defined indications such as bothersome menopausal symptoms, not as a universal anti-aging treatment.

This means the clinician should be cautious with vague presentations. Fatigue alone is not enough. Weight gain alone is not enough. Looking older than expected is not enough. The history must show a pattern that supports further hormone-focused evaluation rather than a purely cosmetic concern or a nonspecific wellness complaint.

Symptom-Based Consultation

The consultation should begin with the patient's actual complaints in their own words. What has changed? When did it begin? Was the onset gradual or sudden? Which symptoms are most bothersome? How much do they affect daily life, work, relationships, sleep, sexual function, mood, and confidence?

A symptom-based consultation is especially useful because endocrine problems often present as clusters rather than isolated complaints. Menopause may involve hot flashes, night sweats, sleep disturbance, mood changes, pain during sex, and concentration issues. Hypothyroidism may present with fatigue, dry skin, hair changes, low mood, constipation, and cold sensitivity.

Low testosterone may present with low libido, reduced morning erections, low energy, and reduced vitality. The history should therefore look for patterns, not just isolated symptoms.

Past Medical History

Past medical history is essential because it helps identify both possible causes of symptoms and possible risks of treatment. The clinician should ask about thyroid disease, diabetes, obesity, hypertension, liver disease, sleep apnea, depression, anxiety, infertility, thromboembolic history, cardiovascular disease, cancer history, gynecologic disease, prostate disease, and prior hormone use. In menopause care, ACOG highlights the importance of screening for issues such as breast or endometrial cancer, stroke, heart attack, blood clots, and liver disease when considering hormone therapy.

This part of the history also helps prevent misdiagnosis. A patient with fatigue and low mood may have depression, sleep apnea, thyroid disease, or medication side effects rather than a primary sex-hormone problem. A patient with abnormal bleeding may need gynecologic evaluation before any menopausal hormone therapy is even considered.

Medication and Supplement Review

Medication review is one of the most overlooked parts of hormone assessment. Many drugs and supplements can affect symptoms, test interpretation, or treatment safety. The clinician should ask about hormonal contraception, antidepressants, steroids, opioids, thyroid medication, weight-loss medications, sleep medications, herbal products, and over-the-counter “hormone support” supplements.

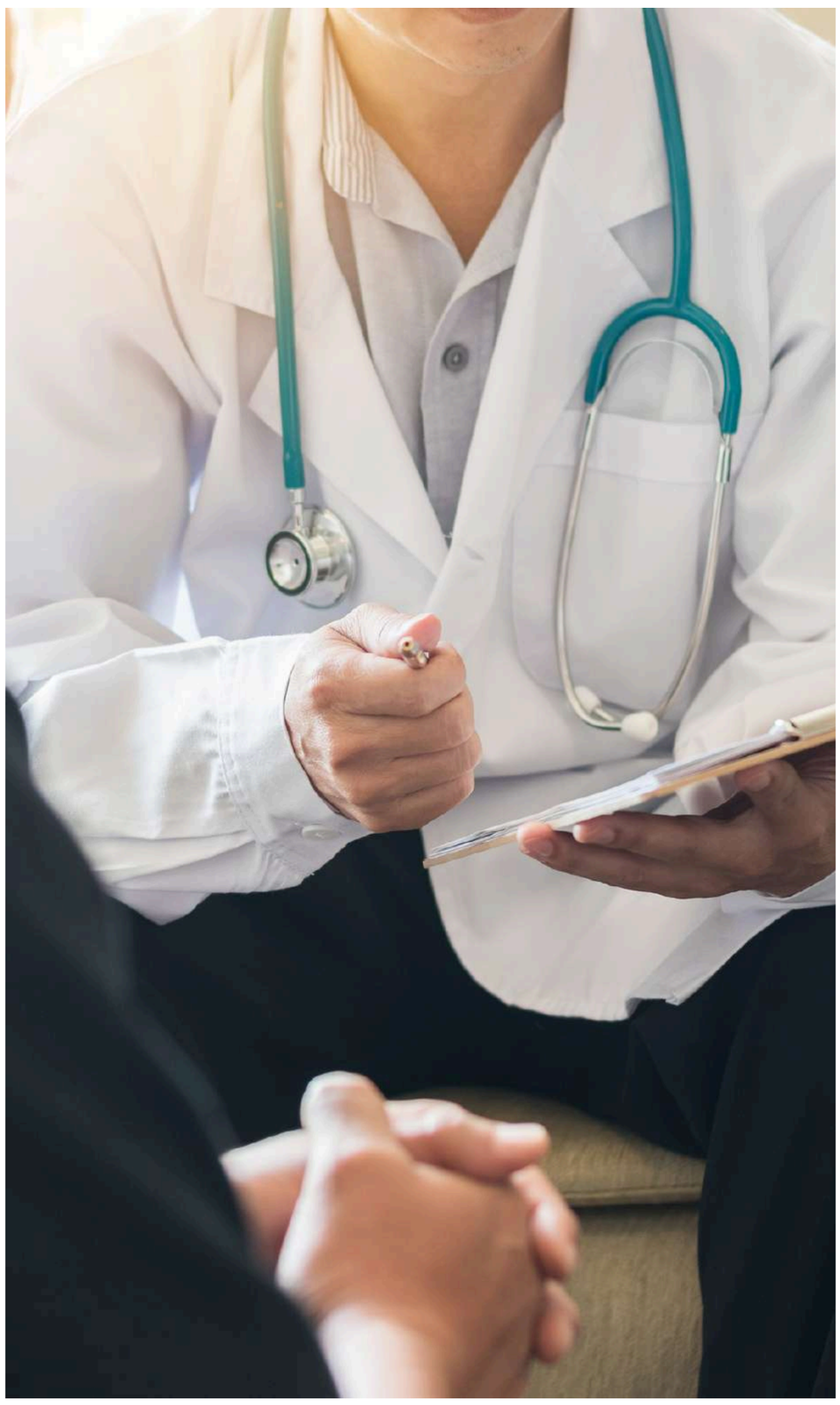
This matters for two reasons. First, medications can mimic endocrine complaints. Second, they can interfere with assessment or treatment. Thyroid hormone replacement, for example, can be affected by how and when other substances are taken. Patients may also be using supplements that create false confidence or confusion about what has already been tried.

Reproductive and Menstrual History

In women, reproductive and menstrual history is central to proper interpretation. The clinician should ask about menstrual regularity, last menstrual period, recent cycle changes, heavy bleeding, skipped periods, pregnancy history, contraception, fertility plans, and menopausal symptoms.

The menopausal transition is often diagnosed clinically, and the pattern of cycle change plus symptoms may be more informative than ordering large hormone panels without context.

In men, reproductive history should still be addressed. Fertility plans are especially important before testosterone therapy is considered, because testosterone treatment may affect fertility. That makes reproductive goals a key part of history taking, not an optional extra question.



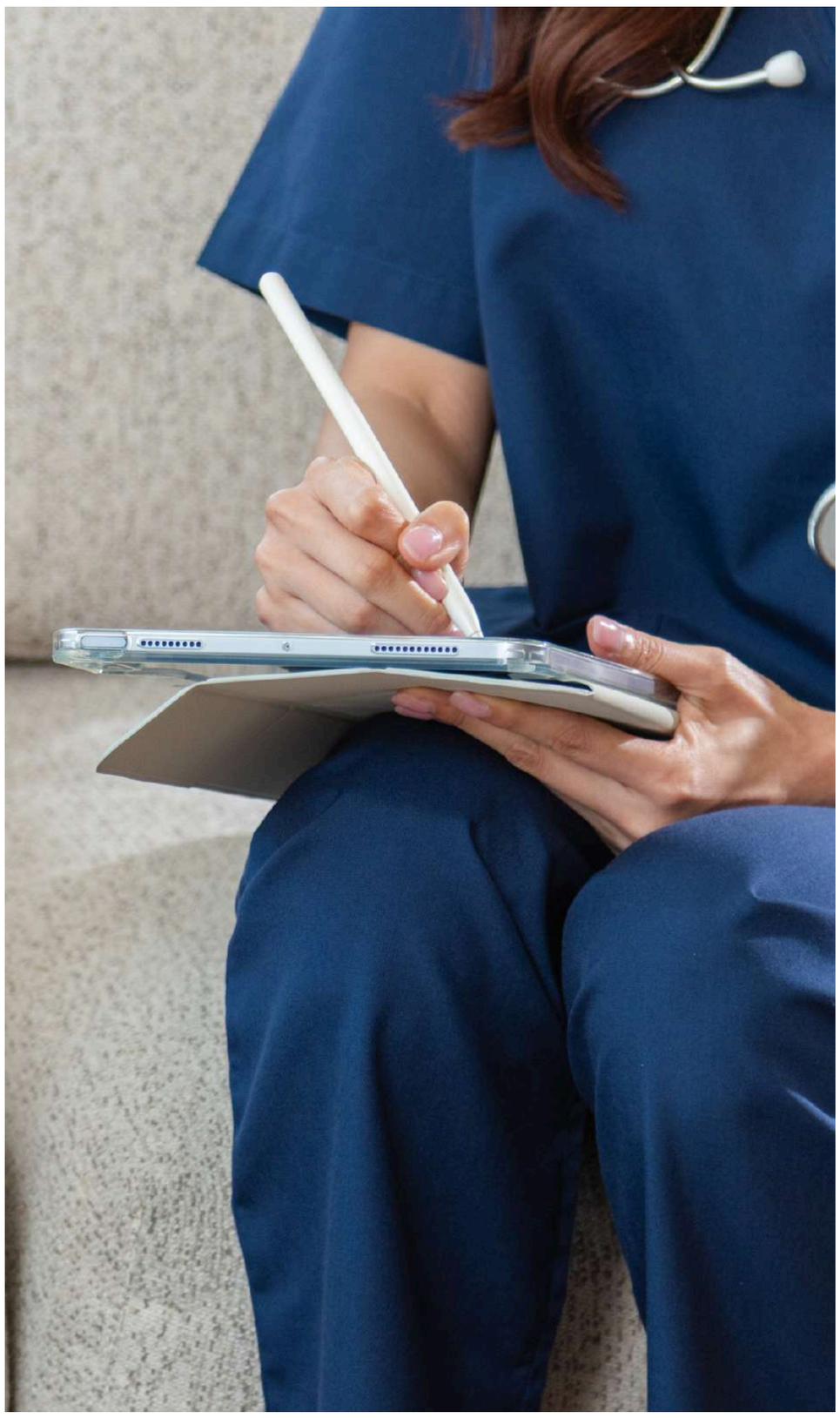
Sexual Health, Sleep, Energy, and Mood Assessment

These four domains are among the most important in hormone-focused consultations because they are where many endocrine symptoms are felt most clearly.

Sexual health questions should include libido, vaginal dryness, pain during sex, arousal changes, erectile function, and morning erections where relevant. Menopause can affect sexual comfort and desire, while low testosterone in men can affect libido and sexual function.

Sleep history should include difficulty falling asleep, staying asleep, waking unrefreshed, snoring, night sweats, and whether poor sleep started before or after other symptoms. Menopausal transition commonly includes trouble sleeping, and sleep problems themselves can worsen fatigue, mood, and body-composition concerns.

Energy assessment should look beyond “Do you feel tired?” A better question is whether the patient feels physically weak, mentally drained, less motivated, less resilient, or unable to recover like before. Mood assessment should include irritability, anxiety, low mood, poor concentration, forgetfulness, and emotional changes.



These are common in both endocrine and non-endocrine conditions, so they should be documented carefully rather than assumed to be hormonal.

Sample History-Taking Form

Below is a simple clinical template that can be used quickly in practice or adapted into a consultation form.

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Pre-Treatment History

Client Information

Name ----------
Surname ----------
Contact Number / Email ----------
Website / Social Media ----------

Chief concern

- ☐ fatigue
- ☐ low libido
- ☐ poor sleep
- ☐ hair thinning
- ☐ hot flashes
- ☐ weight gain
- ☐ mood changes
- ☐ skin dryness

Symptom timeline

When did symptoms begin? ----------
Were they gradual or sudden? ----------
Are they getting worse, stable, or fluctuating?

Which symptoms are most bothersome?

Menopause / reproductive history

Last menstrual period

Cycle regularity

Fertility plans

Pregnancy history

Contraception

Vaginal dryness, painful intercourse, abnormal bleeding

Male reproductive history

Libido changes

Morning erections

Erectile changes

Fertility plans

Prior testosterone use

History of anabolic steroid use

Sleep

- ☐ Night waking
- ☐ Night sweats
- ☐ Unrefreshing sleep
- ☐ Difficulty falling asleep
- ☐ Snoring / possible sleep apnea
- ☐ other ----------

Energy and mood

- ☐ Low energy
- ☐ Anxiety or irritability
- ☐ Depressed mood
- ☐ Poor motivation
- ☐ Brain fog / concentration issues
- ☐ other ----------

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Hair, skin, body composition

- ☐ Dry skin
- ☐ Weight change
- ☐ Muscle loss
- ☐ Hair thinning or shedding
- ☐ Increased abdominal fat
- ☐ other ----------

Past medical history

- ☐ Thyroid disease
- ☐ Liver disease
- ☐ Cancer history
- ☐ Depression / anxiety
- ☐ other ----------
- ☐ Diabetes / insulin resistance
- ☐ Hypertension / cardiovascular disease
- ☐ Sleep apnea
- ☐ Blood clots

Medication and supplement review

Prescription medications ----------
Hormone use ----------
Thyroid medication ----------
Contraceptives ----------
Antidepressants ----------
Steroids ----------
Supplements / herbs / “hormone boosters”

Red flags / safety review

Unexplained bleeding

Breast or endometrial cancer history

Prostate issues

Liver disease

Recent heart attack or stroke

History of thrombosis

Pregnancy

Initial impression

Likely hormonal pattern?

Possible non-hormonal contributors?

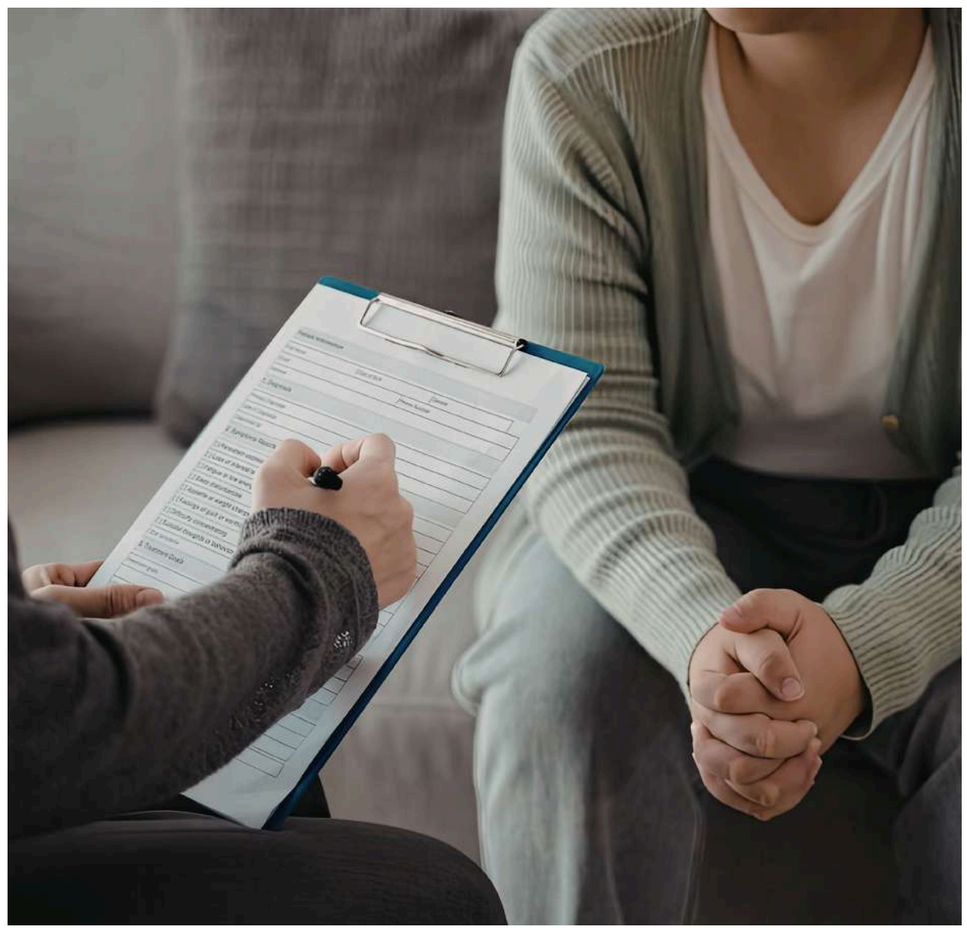
Need for labs?

Need to delay treatment?

Need for referral?

Quick Clinical Takeaway

A good hormone consultation is focused, structured, and pattern-based. The goal is not to prove that every complaint is hormonal. The goal is to identify whether the patient's symptoms, life stage, risks, and history support further endocrine evaluation and whether treatment would be both appropriate and safe. A careful history often prevents the wrong treatment before it ever begins.



4



HORMONE TESTING, BIOMARKERS, AND CLINICAL INTERPRETATION

Hormone testing should be practical, targeted, and clinically driven. In aesthetic and anti-aging practice, the goal is not to order the biggest possible panel. The goal is to answer the right question. A patient with low libido and reduced vitality may need a testosterone-focused workup. A patient with fatigue, dry skin, and hair shedding may need thyroid testing first. A patient with hot flashes and cycle change may need a menopause-focused evaluation that relies more on history than on a broad hormone panel. Good testing improves clarity. Poor testing creates noise.

Principles of Hormone Testing

The first principle is that testing must follow the clinical picture. Symptoms come first, then focused laboratory evaluation. In men, hypogonadism should be diagnosed only when symptoms or signs are present together with unequivocally and consistently low testosterone. That means a lab value alone is not enough.

The second principle is that not every hormone complaint requires the same panel. Thyroid questions require thyroid testing.



Testosterone questions require testosterone testing. Possible cortisol problems require a much more cautious approach, because cortisol is strongly influenced by time of day, stress, illness, and medications. Growth hormone disorders are not screened with random GH in routine aesthetic practice; IGF-1 is generally the more useful marker when there is a real concern.

The third principle is timing. Some hormones fluctuate significantly. Testosterone should be checked in the early morning, and low values should be repeated on a different early morning before diagnosis is made.

Blood-Based Biomarkers Commonly Used in Practice

The most useful blood tests depend on the suspected imbalance.

For testosterone-related complaints, the key starting test is total testosterone, usually followed by repeat testing if the result is low. LH and FSH help distinguish primary from secondary hypogonadism, and prolactin may be useful in selected cases.

For thyroid-related complaints, TSH is usually the best initial screening test. Free T4 helps clarify the pattern, and T3 may be useful when hyperthyroidism is suspected. The American Thyroid Association notes that T3 testing is often useful in hyperthyroidism but rarely helpful in hypothyroidism, because TSH and FT4 usually become abnormal earlier.

For suspected adrenal insufficiency, morning cortisol and ACTH are the key starting tests. NIDDK notes that blood tests can show whether cortisol levels are too low, and that ACTH-based testing is used to evaluate adrenal response.

For suspected GH excess, IGF-1 is the more practical screening test. If IGF-1 is high and the clinical suspicion is real, an oral glucose tolerance test with GH measurement may be used diagnostically.

General baseline tests are also useful in most patients because they improve safety and context. These commonly include CBC, CMP, lipid profile, and HbA1c. In testosterone assessment, for example, CBC matters because hematocrit becomes important if treatment is later considered.

Timing of Laboratory Evaluation

Timing matters most in testosterone and cortisol testing. Testosterone should be measured in the early morning, ideally between about 7 and 10 AM, and low results should be confirmed on a separate early morning sample.

Cortisol is also highly time-dependent.

A random cortisol level is much less helpful than a properly timed morning cortisol when adrenal insufficiency is part of the concern.

Thyroid testing is less sensitive to time of day, but consistency still helps with interpretation, especially in patients already taking thyroid medication. TSH plus FT4 remains the main practical starting point, with T3 or T4 added selectively depending on the clinical question.

Interpreting Baseline Laboratory Results

Baseline labs should answer two questions: does this support the suspected diagnosis, and is it safe to proceed?

A man with symptoms plus two low early-morning testosterone levels is very different from a man with vague fatigue and one borderline result. A patient with high TSH and low FT4 has a much clearer thyroid pattern than a patient with normal thyroid markers and nonspecific complaints. A low morning cortisol may suggest adrenal insufficiency, but it needs proper medical interpretation and often further confirmation.

Baseline interpretation should also identify safety issues. CBC, CMP, lipids, and HbA1c are helpful because they reveal metabolic or organ-function concerns that may influence whether treatment should begin now, later, or not at all.

Timing of Laboratory Evaluation

A testosterone pattern often includes low libido, fewer morning erections, reduced vitality, and reduced sexual function. A menopause-related pattern often includes hot flashes, night sweats, cycle irregularity, vaginal dryness, and sleep disruption. A thyroid pattern often includes fatigue, hair shedding, dry skin, weight change, constipation, and low mood. An adrenal insufficiency pattern may include marked fatigue, dizziness, weight loss, low blood pressure, and steroid-withdrawal history. A GH excess pattern is uncommon in routine practice and should usually trigger specialist evaluation rather than casual screening.



These patterns are helpful, but they are not diagnoses by themselves. They are reasons to investigate further.

Distinguishing Age-Related Change From Endocrine Dysfunction

Aging changes sleep, body composition, energy, skin quality, and sexual function. That does not mean every age-related complaint is a hormone disorder. Endocrine dysfunction becomes more likely when there is a recognizable symptom pattern and the right objective findings. Testosterone therapy should not be used simply because testosterone is lower than it was years ago. Thyroid disease should be diagnosed by the right lab pattern, not by fatigue alone. GH-related testing should not be used as a routine anti-aging screen.

Recognizing Overlapping Presentations

Many patients have more than one contributor. A woman may have menopausal symptoms and thyroid dysfunction. A man with low libido may also have obesity, sleep apnea, or depression. A tired patient may have poor sleep, metabolic dysfunction, and endocrine change at the same time.

This is why testing should be selective and interpretation should stay broad-minded. The purpose is not to force one explanation, but to understand which factors are truly present.



Hormone-Specific Lab Requests

1. Suspected Testosterone Deficiency

When to think of it: low libido, fewer morning erections, reduced vitality, sexual symptoms, reduced muscle mass.

Order:

- Total testosterone, early morning
- Repeat total testosterone, early morning if low
- Free testosterone if clinically needed
- LH
- FSH
- Prolactin
- CBC
- CMP
- PSA if clinically appropriate

Quick note: diagnosis requires symptoms plus consistently low testosterone.

2. Suspected Menopausal / Estrogen-Progesterone Imbalance

When to think of it: hot flashes, night sweats, cycle changes, vaginal dryness, sleep disruption, menopausal symptoms.

Order:

- CBC
- CMP
- TSH
- Free T4
- Consider FSH
- Consider estradiol

Quick note: menopause is often a clinical diagnosis, so testing should support the history, not replace it.

3. Suspected Thyroid Imbalance

When to think of it: fatigue, hair loss, dry skin, weight change, constipation, cold intolerance, low mood.

Order:

- TSH
- Free T4
- T4 if needed by local lab format
- T3 or Free T3 if hyperthyroidism is part of the differential
- CBC
- CMP

Quick note: TSH is the main initial test. T3 is more useful in suspected hyperthyroidism than hypothyroidism.

4. Suspected Cortisol / Adrenal Imbalance

When to think of it: severe fatigue, dizziness, low blood pressure, steroid history, concern for adrenal insufficiency.

Order:

- Morning serum cortisol
- ACTH
- CBC
- CMP
- Electrolytes

Quick note: use carefully. Do not treat vague "stress" complaints as proven adrenal disease without proper evidence.

5. Suspected Growth Hormone / IGF-1 Imbalance

When to think of it: acromegaly-like features, unusual tissue overgrowth, strong clinical suspicion.

Order:

- IGF-1

Quick note: if abnormal and clinically suspicious, refer for endocrine evaluation and possible OGTT with GH measurement.

6. Suspected DHEA / Adrenal Androgen Question

When to think of it: selected adrenal-androgen cases, not routine screening.

Order:

- DHEA-S

Quick note: use selectively, not as a universal "anti-aging" test.

7. Sleep / Melatonin-Focused Complaints

When to think of it: circadian rhythm or sleep complaints.

Order:

- Usually no routine melatonin blood testing

Quick note: focus first on sleep history, habits, timing, medications, and differential diagnosis.



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Sample Lab Request Form

Client Information

Name _____

Surname _____

Date _____

Main Clinical Concern _____

General Baseline

- ☐ CBC
- ☐ CMP
- ☐ Lipid profile
- ☐ TSH
- ☐ Free T4
- ☐ HbA1c

Testosterone-Focused

- ☐ Total testosterone, early morning
- ☐ Free testosterone
- ☐ PSA
- ☐ Repeat total testosterone if low
- ☐ Prolactin

Menopause-Focused

- ☐ FSH
- ☐ Estradiol

Thyroid-Focused

- ☐ TSH
- ☐ T4
- ☐ Free T4
- ☐ T3 / Free T3

Cortisol / Adrenal-Focused

- ☐ Morning cortisol
- ☐ ACTH
- ☐ Electrolytes

GH / IGF-1-Focused

- ☐ IGF-1

Adrenal Androgen-Focused

- ☐ DHEA-S

Notes:

_____

_____

_____

_____

Fast Clinical Use Box

Low libido + low vitality in a man → Testosterone-focused panel

Hot flashes + cycle change + vaginal dryness → Menopause-focused panel + general baseline

Fatigue + dry skin + hair loss + weight change → Thyroid-focused panel + general baseline

Steroid history + dizziness + possible adrenal issue → Cortisol / adrenal-focused panel

Acromegaly-like features → IGF-1 and refer

Sleep complaint only → Sleep history first, not routine melatonin testing

Quick Clinical Takeaway

The best hormone testing strategy is simple: start with the suspected imbalance, order only what helps answer that question, and interpret everything in the context of symptoms and history. A focused panel is usually more useful than a broad, unfocused "hormone check."



5



RISK FACTORS, CONTRAINDICATIONS, AND SAFETY SCREENING

Before starting hormone therapy, the clinician must decide not only whether treatment may help, but whether it is safe. This step is essential because many patients who appear suitable from a symptom perspective may still require delay, modification, or referral once their risk profile is reviewed. In hormone-based care, patient selection is inseparable from safety screening.

Absolute and Relative Contraindications

Contraindications vary depending on the hormone being considered, but the basic principle is simple: some situations make treatment inappropriate, while others require caution and individualized judgment.

For menopausal hormone therapy, systemic treatment is generally not recommended in patients with a history of breast or endometrial cancer, stroke, heart attack, blood clots, or liver disease. Unexplained vaginal bleeding also requires evaluation before treatment is considered.

For testosterone therapy in men, the Endocrine Society recommends against starting treatment in men planning fertility in the near term, and in men with breast or prostate cancer, elevated hematocrit,



untreated severe obstructive sleep apnea, severe lower urinary tract symptoms, uncontrolled heart failure, recent myocardial infarction or stroke, or thrombophilia.

Relative contraindications are not automatic exclusions, but they raise the level of caution. These include complex cardiovascular risk, obesity, sleep apnea under investigation, significant metabolic disease, prior hormone intolerance, or unclear baseline lab abnormalities. In these patients, treatment may still be possible, but only after a more careful review of risks, goals, and monitoring.

Cardiovascular and Thrombotic Risk

Cardiovascular and clotting risk are among the most important safety issues in hormone therapy. In menopausal hormone therapy, route matters. ACOG notes that both combined hormone therapy and estrogen-only therapy carry a small risk of stroke and deep vein thrombosis, and that patches, sprays, and rings may pose less risk than oral pills.

This matters in practice because a patient with obesity, smoking history, hypertension, migraine, or prior thrombotic risk factors may not be a good candidate for certain formulations, even if her symptoms are significant.

Risk assessment should therefore include personal and family history of clotting, smoking, blood pressure, weight, mobility, and cardiometabolic status.

With testosterone therapy, cardiovascular caution is also necessary. The Endocrine Society lists recent myocardial infarction or stroke within the last 6 months and uncontrolled heart failure among the reasons not to begin therapy. Elevated hematocrit and thrombophilia are also important because they may increase treatment risk.

Cancer-Related Considerations

Cancer history must always be reviewed carefully before hormone treatment begins. In women, prior breast cancer and endometrial cancer are major concerns when considering systemic menopausal hormone therapy. ACOG lists both among the main reasons systemic treatment is usually not recommended.

In men, testosterone therapy should not be started in patients with breast cancer or prostate cancer without specialist involvement. The Endocrine Society also recommends evaluation when PSA is elevated or when there is an abnormal prostate finding before treatment is initiated. In practical terms, cancer-related history should never be treated as a small detail in an aesthetic setting.

If the patient has a hormone-sensitive cancer history, unclear oncology history, abnormal bleeding, or concerning prostate findings, this moves the case out of routine prescribing and into a more cautious pathway.

Liver Disease, Endocrine Disease, and Metabolic Concerns

Liver disease is important because many hormone therapies depend on hepatic metabolism, and active liver disease is a recognized reason to avoid or defer certain treatments. ACOG specifically lists liver disease among the reasons systemic menopausal hormone therapy is usually not recommended.

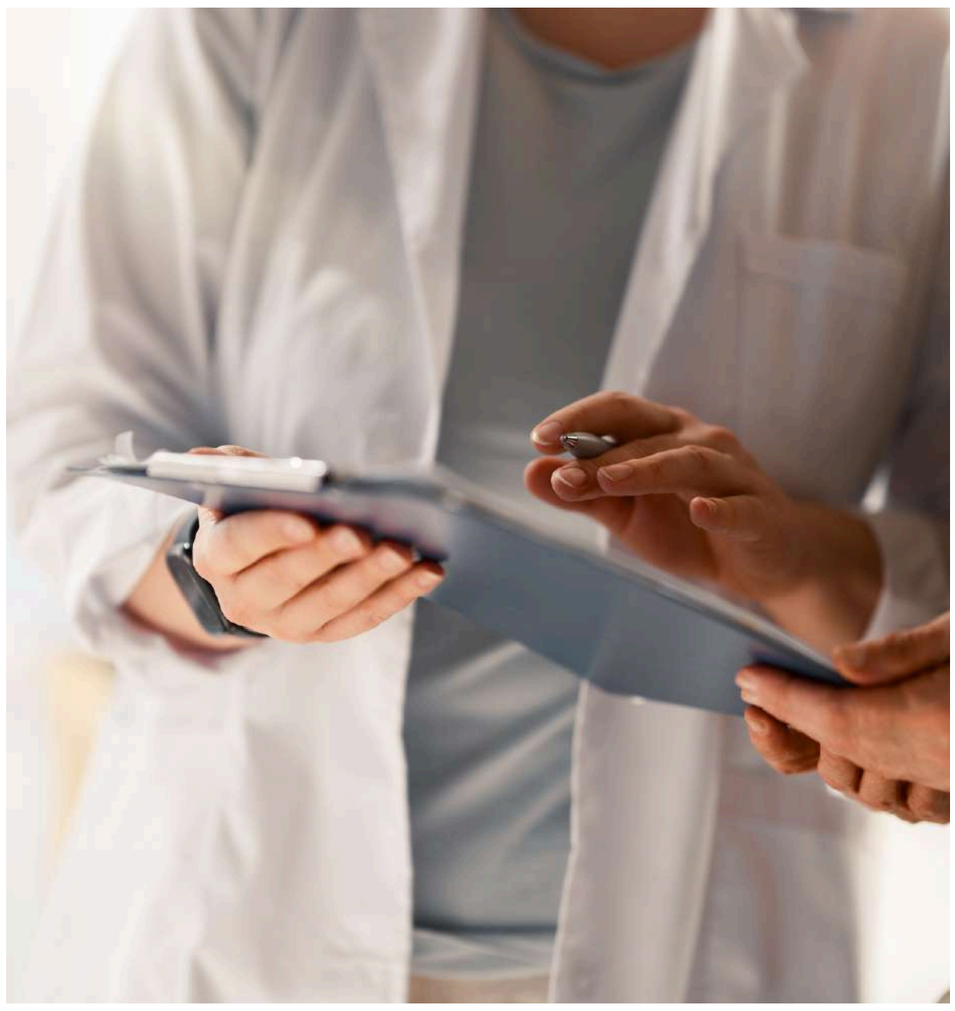
Other endocrine disorders must also be considered. A patient asking for sex-hormone treatment may actually have untreated thyroid disease, pituitary dysfunction, hyperprolactinemia, adrenal disease, or poorly controlled diabetes. These conditions may change the interpretation of symptoms, alter lab results, or make the treatment plan less clear.

Metabolic disease also matters. Obesity, insulin resistance, dyslipidemia, and sleep apnea do not always forbid treatment, but they may increase risk and complicate diagnosis. In men, for example, obesity and sleep apnea may overlap with low-testosterone symptoms and make the clinical picture less straightforward.

When to Delay Treatment

Treatment should be delayed when the diagnosis is not yet clear, when baseline abnormalities need follow-up, or when important risks have not been addressed. Examples include unexplained vaginal bleeding, one low testosterone result without confirmation, abnormal hematocrit, uncontrolled cardiometabolic disease, suspected sleep apnea, suspicious prostate findings, or significant untreated endocrine disease.

Delay is not a failure of care. In many cases, it is the step that makes safe care possible. It gives time to repeat labs, gather records, stabilize medical problems, clarify diagnosis, or obtain specialist input.



When Referral Is Necessary

Referral is necessary when the case is outside the clinician's scope, when the diagnosis is uncertain, or when the risk profile is too complex for routine management. This includes suspected pituitary disease, unclear thyroid dysfunction, adrenal insufficiency, hormone-sensitive cancer history, unexplained abnormal bleeding, fertility-related decisions, difficult prostate issues, and complex cardiovascular or thrombotic history.

Referral is also appropriate when treatment may still be possible, but only with co-management. A menopausal patient after breast cancer treatment, a man with suspected hypogonadism who wants fertility, or a patient with possible central endocrine dysfunction are all examples where specialist input improves safety and quality of care. The American Thyroid Association notes that a pattern of low TSH with low free T4 suggests central hypothyroidism, which is not routine primary thyroid management.

Easy-to-Use Safety Screening Checklist

Before treatment, check for the following:

General

- Unclear diagnosis
- Severe uncontrolled medical illness
- Inability to provide follow-up or monitoring

Menopausal hormone therapy

- Unexplained vaginal bleeding
- Breast or endometrial cancer history
- Blood clot history
- Stroke or heart attack history
- Liver disease

Testosterone therapy

- Fertility plans
- Prostate or breast cancer history
- Elevated hematocrit
- Untreated severe sleep apnea
- Severe LUTS
- Uncontrolled heart failure
- Recent MI or stroke
- Thrombophilia

Thyroid / adrenal / other endocrine

- Possible pituitary disease
- Significant unexplained lab abnormalities
- Suspected adrenal insufficiency
- Severe untreated thyroid disease

Sample Pre-Treatment Safety Note

Safety review completed:

□ Contraindications reviewed

□ Cardiovascular risk reviewed

□ Thrombotic risk reviewed
□ Cancer history reviewed
□ Liver disease reviewed
□ Fertility plans reviewed if relevant
□ Baseline labs reviewed
□ Need for delay assessed
□ Need for referral assessed

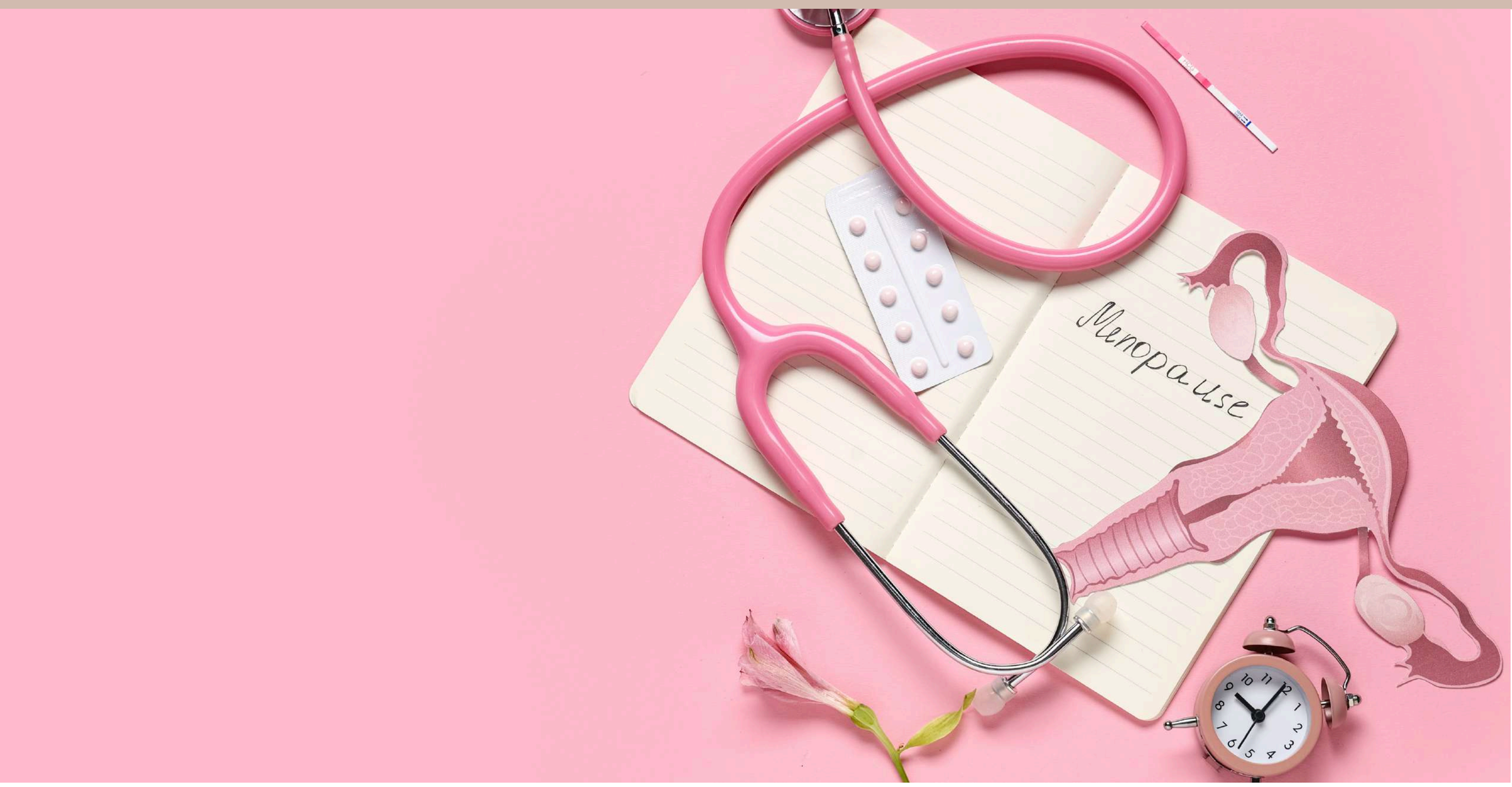
Decision:

□ Proceed
□ Delay and investigate further
□ Refer / co-manage

Reason: _____

Quick Clinical Takeaway

Hormone therapy should begin only after risk has been assessed as carefully as symptoms. A patient may be symptomatic and still not be ready for treatment. The safest clinician is the one who knows when to proceed, when to pause, and when to refer.



Part III. Core Hormones in Clinical Practice

This section focuses on the individual hormones most relevant to hormone-related assessment and treatment in aesthetic and anti-aging practice. The purpose is not to turn every aging complaint into a hormone diagnosis, but to help the clinician understand how specific hormones influence symptoms, tissue health, vitality, sexual function, and overall patient presentation. Each chapter is designed to connect physiology with practical clinical use, so the reader can move from understanding the hormone itself to recognizing its relevance in real patients.

In this part, each hormone is discussed separately because each one has its own physiology, symptom pattern, indications, risks, and treatment logic.

Some hormones are central to established replacement therapy, such as testosterone, estrogen, progesterone, and thyroid hormone. Others, such as cortisol, melatonin, growth hormone, DHEA, and pregnenolone, require more caution, more selective interpretation, or a stronger emphasis on limits and referral. The aim is to keep these distinctions clear.

This section is also intentionally practical. Along with the descriptive material, the treatment portions are designed to be faster to use, with concise clinical summaries and quick-reference tables. That way, the reader can understand the science while still having an accessible structure for day-to-day review in practice.

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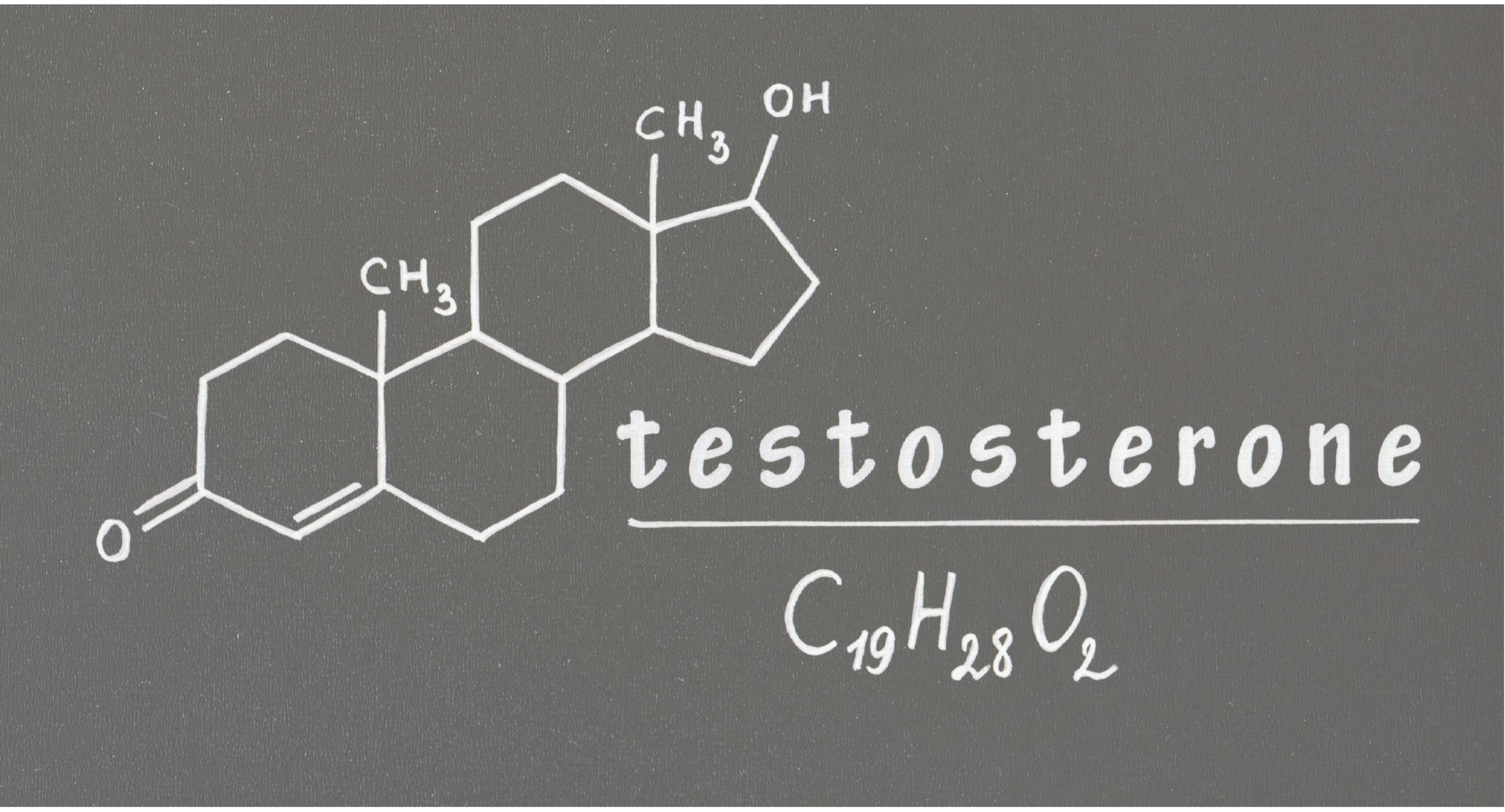


TESTOSTERONE

Testosterone is one of the most discussed hormones in anti-aging medicine, but it is also one of the most frequently misunderstood. It plays a major role in sexual function, body composition, bone health, energy, and aspects of mood and vitality, yet its proper clinical use depends on careful diagnosis and monitoring rather than broad “optimization” claims. Current endocrine guidance emphasizes that testosterone therapy should be used in men with symptoms or signs of deficiency together with unequivocally and consistently low testosterone, not as a routine anti-aging treatment for healthy men.

Physiology and Production

Testosterone is produced mainly by the testes in men and in much smaller amounts by the ovaries and adrenal glands in women. Its production is regulated through the hypothalamic-pituitary-gonadal axis, especially through luteinizing hormone stimulation of the Leydig cells in the testes. In circulation, testosterone exists as protein-bound and free fractions, and this is why total testosterone and free testosterone may not always tell exactly the same story in clinical practice.



Testosterone influences sexual desire, erectile physiology, muscle and bone maintenance, red blood cell production, fat distribution, and elements of mood and motivation. Because its actions are systemic, deficiency often presents as a cluster of symptoms rather than as one isolated complaint.

Age-Related Decline and Deficiency States

Testosterone levels may decline with age, but age-related decline alone is not the same as pathologic hypogonadism. The major endocrine and urologic guidelines both stress that diagnosis requires the combination of symptoms and repeatedly low testosterone, usually confirmed with early-morning testing. Healthy aging men should not be routinely screened or treated without a proper indication.

Deficiency states may be primary, meaning the testes are not producing testosterone adequately, or secondary, meaning the issue arises higher in the hormonal axis at the pituitary or hypothalamic level. That distinction matters because it affects evaluation, cause, and sometimes referral.

Clinical Relevance in Men

In men, the symptoms most suggestive of testosterone deficiency include low libido, erectile dysfunction, fewer spontaneous or morning erections, and reduced sexual satisfaction. Other possible features include low energy, depressed mood, poor concentration, reduced muscle bulk, increased body fat, lower bone density, and reduced physical resilience, but these are less specific and overlap with many other conditions. This is especially important in aesthetic and anti-aging practice, where patients often present with fatigue, body-composition concerns, and reduced vitality. Those complaints may be related to testosterone deficiency, but they may also reflect obesity, sleep apnea, depression, medication effects, chronic stress, or poor sleep. Testosterone should therefore be considered only after a proper history, examination, and appropriately timed lab work.

Clinical Relevance in Women

Testosterone is also physiologically relevant in women, but its role is more limited and treatment is much more selective. The most evidence-based use of systemic testosterone in women is for hypoactive sexual desire disorder in carefully assessed patients, especially after a biopsychosocial evaluation has excluded other major contributors. The ISSWSH guideline supports this use but does not support

testosterone for general well-being, anti-aging, cognition, or body-composition enhancement in women.

For this reason, testosterone in women should be approached with much greater caution than it often is in commercial anti-aging settings. The main clinically relevant domain is sexual desire, not broad rejuvenation.

Effects on Libido, Mood, Body Composition, and Vitality

Testosterone affects libido most consistently, and sexual symptoms are among the most clinically useful clues to deficiency. It also influences body composition by helping support lean mass and by interacting with fat distribution and bone health. Mood, motivation, and perceived vitality may also be affected, although these are less specific outcomes and should not be overinterpreted without the right clinical context.

For the aesthetic clinician, the practical point is that testosterone-related symptoms often influence how patients experience aging overall. A patient may describe looking older, feeling weaker, being less sexually confident, or losing tone and resilience. These may or may not represent testosterone deficiency, but they explain why testosterone becomes such a common topic in anti-aging consultations.

Key Treatment Approaches

The primary treatment approach in men is testosterone replacement in patients with confirmed hypogonadism and no major contraindication. The goal is to improve symptoms and restore testosterone into an appropriate physiologic range, not to create supraphysiologic levels. In women, systemic testosterone should be reserved for carefully selected patients, mainly in the context of hypoactive sexual desire disorder, and with dosing that keeps levels within the normal premenopausal female range.

Treatment should not begin until diagnosis is secure and key safety issues are reviewed, including fertility plans, hematocrit, prostate-related evaluation in men when appropriate, sleep apnea, cardiovascular history, and thrombophilia risk.

According to the Endocrine Society, treatment should only be started in patients with consistent symptoms and confirmed low testosterone on repeat testing.

Common practical starting approaches include:

- **Intramuscular testosterone** (e.g., enanthate or cypionate):

typically 75–100 mg weekly or 150–200 mg every 2 weeks, with preference for more frequent dosing to reduce fluctuations

- **Transdermal gels:**

typically 50 mg once daily, titrated based on serum testosterone and symptom response

- **Transdermal patches:**

typically 4–6 mg applied nightly, adjusted as needed

Dosing should be titrated after 3–6 months based on:

- symptom improvement
- serum testosterone levels (target mid-normal range)
- safety markers such as hematocrit

Dose escalation should be cautious, and lack of symptom response despite normal testosterone levels should prompt reassessment rather than continued dose increase.

Available Formulations

Common formulations in men include transdermal gels, transdermal solutions or patches, short-acting injections, and longer-acting injectable preparations, depending on the jurisdiction and product availability. Each formulation has different advantages in convenience, steadiness of levels, cost, and patient adherence. Guidelines do not identify one formulation as universally superior; selection depends on patient preference, pharmacokinetics, access, and monitoring practicality.

In women, the ISSWSH guideline emphasizes cautious use of systemic therapy and avoidance of male-level dosing. In practice, when testosterone is used for women, clinicians generally rely on very low-dose transdermal approaches intended to maintain physiologic female levels rather than male replacement levels.

Monitoring and Reassessment

Monitoring is essential. The Endocrine Society recommends checking testosterone levels about 3 to 6 months after starting therapy, aiming for the mid-normal range, and monitoring hematocrit at baseline, at 3 to 6 months, and then yearly.

Prostate monitoring should follow age-appropriate and risk-appropriate standards, with further evaluation if PSA changes significantly or prostate findings are abnormal.

Clinical reassessment should include libido, erectile function where relevant, energy, mood, body-composition response, adverse effects, and whether the original treatment goals are actually being met. If symptoms do not improve despite appropriate levels, the clinician should reconsider the diagnosis rather than simply escalating the dose.

Quick-Reference Dosing and Safety Table

Topic	Practical summary
Who to treat	Men with symptoms/signs of deficiency and unequivocally, consistently low testosterone on repeat early-morning testing. Women: only selective cases, mainly HSDD after proper evaluation.
Main baseline labs	Total testosterone, repeat morning testosterone if low, consider free testosterone, LH, FSH, prolactin; CBC and CMP; PSA in appropriate male patients.
Main formulations	Men: gel, patch/solution, short-acting injectable, long-acting injectable depending on availability and patient fit. Women: very low-dose systemic/transdermal approach when indicated, keeping levels in female physiologic range.
General dosing approach	Start with a standard approved replacement regimen for the chosen formulation and titrate to symptom response plus physiologic target levels; avoid supraphysiologic dosing. Female dosing should be a fraction of male dosing and kept within the premenopausal female range.
Monitor at follow-up	Testosterone level at about 3–6 months; hematocrit at baseline, 3–6 months, then yearly; assess symptoms, adverse effects, and prostate-related monitoring as appropriate.
Do not start if	Men planning fertility in the near term, prostate or breast cancer, elevated hematocrit, untreated severe sleep apnea, uncontrolled heart failure, recent MI or stroke, thrombophilia, or other major contraindications.

Quick Clinical Takeaway

Testosterone is clinically important, but it should be handled with precision. In men, it is a replacement therapy for confirmed deficiency, not a general anti-aging drug. In women, its role is much narrower and mainly limited to selected sexual-health indications. The safest approach is always the same: diagnose carefully, dose conservatively, monitor closely, and reassess whether treatment is truly helping.

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ESTROGEN & PROGESTERONE

Estrogen and progesterone are central to female reproductive health, but their relevance goes far beyond fertility. Across the lifespan, these hormones influence thermoregulation, vaginal and urinary comfort, sleep, mood, skin quality, hair changes, and aspects of body composition. In aesthetic and anti-aging practice, many midlife patients present with concerns that are partly shaped by declining ovarian hormone production, even when they do not initially describe their problem as hormonal. The key is to understand when these changes reflect normal reproductive aging, when they become clinically significant, and when treatment is appropriate. Hormone therapy remains the most effective treatment for bothersome vasomotor symptoms of menopause, and vaginal estrogen is effective for vaginal dryness and dyspareunia.

Physiology Across the Female Lifespan

During the reproductive years, estrogen and progesterone fluctuate in a cyclical pattern under the control of the hypothalamic-pituitary-ovarian axis. Estrogen supports endometrial growth, vaginal and vulvar tissue health, and many nonreproductive functions, while progesterone becomes especially important after ovulation and plays a major role in endometrial regulation. These hormones also influence skin hydration, collagen support, sleep, thermoregulation, and mood-related symptoms, which helps explain why hormonal shifts are so clinically visible in midlife.



Perimenopause and Menopause

Perimenopause is the transition period in which ovarian hormone production becomes more variable before menopause is established. Menopause itself is diagnosed retrospectively after 12 months without menstruation in the typical setting. During this transition, patients may develop hot flashes, night sweats, sleep disturbance, vaginal dryness, irregular cycles, mood changes, and changes in sexual comfort. NICE advises diagnosing perimenopause and menopause mainly from symptoms and menstrual history in most people aged 45 or over, rather than relying heavily on laboratory confirmation.

Estrogen Deficiency and Its Clinical Effects

Declining estrogen contributes to many of the symptoms most relevant in clinical practice. Vasomotor symptoms such as hot flashes and night sweats are the best-known examples, but estrogen deficiency also affects vaginal tissues, urinary comfort, sleep quality, and overall quality of life. Vaginal dryness, dyspareunia, irritation, and recurrent urinary symptoms may all reflect genitourinary syndrome of menopause.

NICE notes that vaginal estrogen is effective for vaginal dryness and pain with sex.

From an aesthetic perspective, estrogen decline may also contribute to skin dryness, reduced tissue quality, and the sense of accelerated aging that some patients report during menopause. These effects should not be oversimplified, but they are clinically relevant because the patient often experiences visible and functional changes together.

The Role of Progesterone

Progesterone matters clinically for two main reasons. First, it is part of normal female physiology and shifts significantly during the menopausal transition. Second, when systemic estrogen is used in a woman with an intact uterus, a progestogen is generally needed to protect the endometrium. ACOG states that estrogen-only therapy thickens the uterine lining and increases endometrial cancer risk, while adding progestin decreases this risk.

This is one of the most important practical rules in menopausal hormone therapy. If the uterus is present, endometrial protection must be considered. If the patient has had a hysterectomy, the regimen may differ.

Skin, Hair, Vaginal Health, Sleep, and Mood Implications

Estrogen and progesterone changes can affect multiple quality-of-life domains that overlap

with aesthetic concerns.

Vaginal and vulvar symptoms are strongly linked to estrogen deficiency and often respond well to local estrogen therapy. Vasomotor symptoms can disrupt sleep, which then worsens fatigue, mood instability, and the patient's overall sense of aging. Mood and sleep symptoms are often multifactorial, but hormonal fluctuation is a major contributor for many midlife patients.

In practice, these symptoms matter because a patient who is sleeping poorly, uncomfortable with intercourse, and distressed by hot flashes may also feel that her skin, energy, and overall appearance have changed dramatically. Good hormone assessment recognizes that these concerns are interconnected.

Indications for Therapy

Systemic menopausal hormone therapy is primarily used for bothersome vasomotor symptoms and may also be used in appropriate patients for other menopause-related indications, including selected bone-protection contexts. Local vaginal estrogen is used for genitourinary symptoms such as dryness, discomfort, and dyspareunia. ACOG and NICE both support hormone therapy as an important treatment option when symptoms are clinically significant and contraindications have been considered.

The key is to treat defined symptoms, not to prescribe hormones as a universal anti-aging strategy. Treatment decisions should be individualized by symptoms, age, time since menopause, uterine status, route preference, and risk profile.

Systemic and Local Options

Systemic options include oral and transdermal estrogen-containing therapies, with progestogen added when needed for endometrial protection. Local options include vaginal estrogen preparations used specifically for genitourinary symptoms. ACOG notes that patches, sprays, and rings may pose less risk of deep vein thrombosis than oral pills, and NICE supports vaginal estrogen for vaginal dryness and pain with sex.

A practical distinction is this: systemic therapy is used when symptoms are broader, especially vasomotor, while local vaginal therapy is used when symptoms are primarily genitourinary. In some cases, both may be needed because systemic therapy alone may not fully treat genitourinary syndrome of menopause.

Monitoring, Benefits, and Risk Management

Monitoring should focus on symptom response, tolerability, bleeding pattern, blood pressure, evolving risk profile, and whether

the chosen route and regimen remain appropriate. NICE recommends review after starting or changing treatment and ongoing reassessment thereafter. Benefits include symptom relief, better sleep in many symptomatic patients, improved vaginal comfort, and better quality of life. Risks depend on the individual patient and the chosen therapy, with special attention to thrombotic risk, cardiovascular history, cancer history, liver disease, and unexplained bleeding.

The clinician should also remember that route matters. ACOG notes that oral estrogen may have a prothrombotic effect, whereas transdermal estrogen has little or no such effect in comparison.

Quick Clinical Takeaway

Estrogen and progesterone therapy should be understood as targeted menopause care, not general rejuvenation. Estrogen deficiency can affect vasomotor symptoms, vaginal health, sleep, and quality of life, while progesterone becomes essential for endometrial protection when systemic estrogen is used in a patient with an intact uterus. The safest approach is always individualized: match the regimen to the symptom pattern, choose the route thoughtfully, and reassess regularly.



Practical dosing overview

Estrogen and progesterone therapy should be prescribed using the lowest effective dose to control symptoms, with regimen selection based on symptom profile, uterine status, and patient risk factors. According to the American College of Obstetricians and Gynecologists, treatment should be individualized and regularly reassessed.

Common practical approaches include:

- **Systemic estrogen** (for vasomotor symptoms):Oral estradiol: typically 1–2 mg daily
- **Transdermal estradiol:** typically 25–50 mcg/day patch, adjusted based on response
- **Progesterone** (required if uterus present):Micronized progesterone: typically 100 mg nightly (continuous)
  - or 200 mg nightly for 12–14 days/month (cyclic regimen)
- **Local vaginal estrogen** (for isolated genitourinary symptoms):Low-dose preparations used 2–3 times weekly after initial loading phase

Key practical rules

- Always add progesterone if the patient has an intact uterus to reduce endometrial risk
- Start with a lower dose and titrate based on symptom control
- Transdermal estrogen may be preferred in patients with higher thrombotic risk
- Reassess at ~3 months, then periodically

If symptoms are not improving despite adequate dosing, avoid reflex escalation and reassess diagnosis, adherence, and treatment goals before increasing therapy.

Quick-Reference Regimen Table

Clinical situation	Practical approach
Bothersome hot flashes / night sweats	Consider systemic menopausal hormone therapy if appropriate and not contraindicated.
Vaginal dryness / dyspareunia / GSM	Consider local vaginal estrogen; this is effective for vaginal dryness and pain with sex.
Uterus intact	Add progestogen/progestin with systemic estrogen for endometrial protection.
No uterus	Estrogen-only systemic approach may be used if otherwise appropriate.
Higher clot-risk concern	Consider whether a transdermal route is more suitable than oral therapy.
Primarily genitourinary symptoms, minimal vasomotor symptoms	Local therapy may be more appropriate than full systemic therapy.
History of breast or endometrial cancer, blood clots, stroke, MI, liver disease, unexplained bleeding	Do not treat routinely; reassess, delay, or refer as appropriate.

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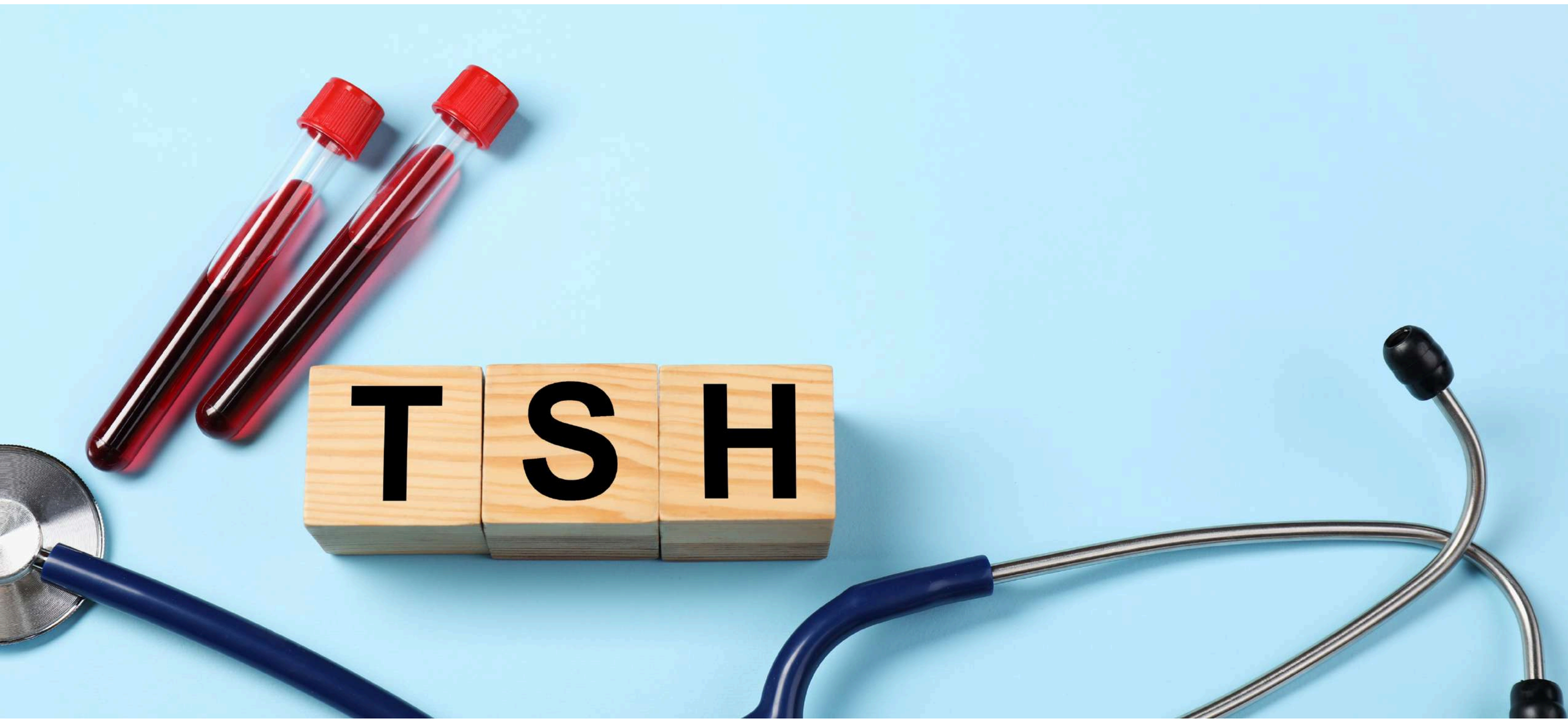
THYROID HORMONES

Thyroid hormones are highly relevant in hormone-focused practice because thyroid dysfunction can mimic or worsen many complaints that patients describe as aging. Fatigue, weight change, dry skin, hair shedding, low mood, puffiness, and poor concentration are common thyroid-related complaints, but they are also nonspecific. That is why thyroid assessment must combine symptoms with the correct lab pattern, rather than relying on symptoms alone. The American Thyroid Association states that the best initial test of thyroid function is TSH, and that blood tests commonly used to evaluate thyroid function include TSH, T4, T3, and free T4.

Thyroid Physiology

The thyroid gland mainly produces thyroxine, or T4, which acts largely as a prohormone, and smaller amounts of triiodothyronine, or T3, which is the more active hormone at the tissue level.

Thyroid hormone production is regulated by pituitary TSH, which rises when thyroid hormone output is inadequate and usually falls when thyroid hormone levels are excessive. Because of this feedback relationship, TSH often changes before T4 and T3 become clearly abnormal, which is why it is such a useful first-line test.



Hypothyroid and Hyperthyroid Patterns

Primary hypothyroidism usually shows a high TSH and a low free T4. The ATA notes that a high TSH generally indicates the thyroid is not making enough hormone. Hyperthyroidism shows the opposite pattern, where TSH is usually low because the thyroid is producing too much hormone. T3 testing can be helpful in suspected hyperthyroidism, but the ATA notes that T3 testing is rarely useful in hypothyroidism because TSH and free T4 become abnormal earlier.A low TSH does not always mean hyperthyroidism, because it can also occur in central hypothyroidism if the pituitary is failing to produce enough TSH. The ATA thyroid function test guidance notes this pattern as an important exception.

Subclinical Dysfunction

Subclinical hypothyroidism usually means TSH is above the reference range while free T4 remains normal. NICE recommends considering levothyroxine for adults with subclinical hypothyroidism if TSH is 10 mIU/L or higher on 2 separate occasions 3 months apart, and considering a 6-month trial for symptomatic adults under 65 with a TSH above range but below 10 on 2 occasions 3 months apart.

This matters in practice because not every mildly abnormal TSH requires immediate lifelong therapy. Symptoms, age, repeat testing, and the overall clinical picture all matter.

Thyroid-Related Effects on Fatigue, Weight, Skin, and Hair

Thyroid dysfunction is especially relevant in aesthetic medicine because it can affect how patients look and feel at the same time. Hypothyroidism commonly causes fatigue, dry skin, hair thinning, weight gain, constipation, cold intolerance, and cognitive slowing. The ATA patient guidance emphasizes that hypothyroidism happens when the thyroid does not make enough hormones, and its symptoms can be broad and nonspecific.

From a practical standpoint, this means a patient may complain about “aging badly” when the real issue is partly thyroid-related. Dry skin, puffiness, hair shedding, and low energy can easily be interpreted as purely aesthetic decline unless the clinician considers thyroid disease in the differential.

Relevance to Aesthetic Complaints

Thyroid disease does not replace proper aesthetic diagnosis, but it can influence patient satisfaction and treatment response.

A patient with untreated hypothyroidism may continue to feel unwell, fatigued, and dissatisfied despite good aesthetic care because the underlying systemic problem is still active. In that sense, thyroid assessment is not just endocrine housekeeping; it can directly improve the quality of patient selection and the realism of treatment planning. This is a clinical inference based on the well-established overlap between thyroid symptoms and common anti-aging complaints.

Treatment Overview

For hypothyroidism, levothyroxine remains the standard treatment. The ATA notes that thyroid hormone treatment is used to replace deficient hormone, and NICE recommends levothyroxine as the main treatment for primary hypothyroidism.

In routine practice, treatment aims to restore euthyroidism, not to create an “enhanced” metabolic state. Thyroid hormone should not be used as a cosmetic weight-loss drug or generalanti-aging enhancer. The therapeutic goal is normalization of thyroid function and improvement of true thyroid-related symptoms.

Monitoring Essentials

Monitoring depends on whether treatment has started and whether the patient is stable.



NICE recommends repeating TSH measurements after treatment changes and then using ongoing monitoring intervals once a stable dose is reached. The exact interval can vary, but reassessment after dose changes is essential because both under-treatment and over-treatment carry risk.

When interpreting follow-up, TSH and free T4 are usually the most useful routine markers. T3 is generally not needed for routine monitoring of hypothyroidism, though it may have a role in selected hyperthyroid contexts.

Practical dosing overview

Thyroid hormone replacement is based on levothyroxine (T4) as the standard of care, with dosing individualized according to age, weight, and cardiovascular risk. The goal is to restore TSH to the reference range while improving symptoms, avoiding overtreatment.

Common practical approaches include:

- Healthy adults (<60 years, no cardiac disease):

starting dose typically around 1.6 mcg/kg/day

- Older patients or those with cardiovascular risk:

start lower, typically 25–50 mcg daily, with gradual titration

- Subclinical hypothyroidism:

consider lower starting doses (e.g., 25–50 mcg daily) based on symptoms and TSH level

Key practical rules

- Take levothyroxine on an empty stomach, ideally 30–60 minutes before breakfast
- Avoid concurrent intake with calcium, iron, or coffee, which can impair absorption
- Adjust dose in small increments (12.5–25 mcg) based on follow-up TSH

Monitoring and titration:

- Recheck TSH after ~6–8 weeks following any dose change
- Target: TSH within reference range (avoid suppression)
- Once stable: monitor annually

If symptoms persist despite normal TSH, avoid repeated dose escalation and reassess alternative causes (sleep, mood, metabolic factors) rather than over-replacement.

Quick-Reference Dosing and Lab Table

Topic	Practical summary
Best first test	TSH is the best initial thyroid function test in most cases.
Main thyroid labs	TSH, Free T4, and when clinically useful, T4 and T3/Free T3.
Typical hypothyroid pattern	High TSH + low Free T4 suggests primary hypothyroidism.
Possible central pattern	Low TSH + low Free T4 suggests central hypothyroidism and needs further evaluation.
T3 usefulness	T3 can help in suspected hyperthyroidism, but is rarely helpful in hypothyroidism.
Standard treatment	Levothyroxine (L-T4) is the standard treatment for hypothyroidism.
Subclinical hypothyroidism	Consider levothyroxine if TSH ≥10 mIU/L on 2 tests 3 months apart; selective trial may be considered in some symptomatic adults under 65 with lower TSH elevation.
Dose philosophy	Start with an appropriate replacement dose for the patient's age and risk profile, then titrate based on labs and symptoms; avoid over-replacement. This is consistent with NICE/ATA treatment principles.
Monitoring	Recheck after dose changes, then continue periodic TSH-based monitoring once stable.

Easy-to-Use Thyroid Lab Request

Suspected thyroid imbalance

- TSH
- Free T4
- T4 if needed by local lab format
- T3 or Free T3 if hyperthyroidism is part of the differential
- CBC
- CMP

Quick Clinical Takeaway

Thyroid hormone problems are common, easy to miss, and highly relevant in patients complaining of fatigue, skin change, hair loss, weight change, and low vitality. The most practical approach is simple: start with TSH, add Free T4, use T3/T4 selectively, treat true hypothyroidism with levothyroxine, and monitor carefully rather than aggressively.

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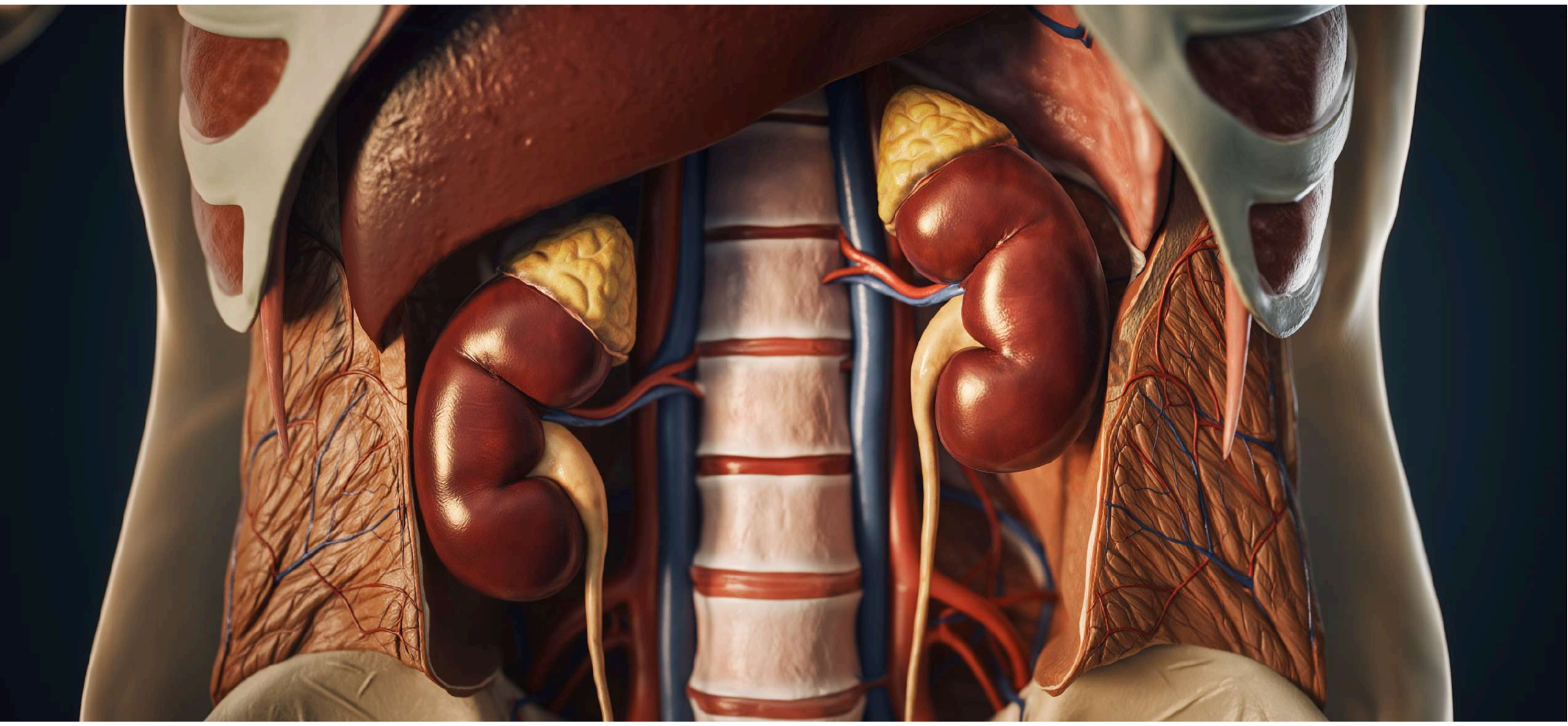


CORTISOL

Cortisol is one of the most misunderstood hormones in anti-aging medicine. Patients often use the word “cortisol” to explain fatigue, weight gain, poor sleep, stress, or the feeling of aging faster than expected. While cortisol is indeed central to stress physiology, evidence-based endocrinology does not treat every stress-related complaint as an adrenal disorder. In practice, the clinician must understand what cortisol actually does, when testing is appropriate, and when symptoms suggest a real endocrine problem rather than a vague stress narrative.

Stress Physiology and HPA Axis Function

Cortisol is produced by the adrenal glands under the control of the hypothalamic-pituitary-adrenal, or HPA, axis. The hypothalamus signals the pituitary, the pituitary releases ACTH, and ACTH stimulates the adrenal glands to produce cortisol. This system helps the body respond to stress, maintain blood pressure, regulate glucose availability, and support normal metabolic adaptation. Endocrine Society and NIDDK guidance both treat cortisol as an essential survival hormone rather than a simple “stress marker.



Cortisol Rhythm and Dysregulation

Under normal conditions, cortisol follows a daily rhythm. It is highest in the morning and then falls across the day. That rhythm is one reason cortisol testing is time-sensitive. Morning blood testing is far more informative than random cortisol measurement when adrenal insufficiency is being considered. Disruption of cortisol regulation can occur in serious endocrine disease, prolonged glucocorticoid exposure, pituitary disease, or true hypercortisolism, but routine life stress does not automatically equal adrenal pathology.

Sleep, Fat Distribution, Inflammation, and Aging

Cortisol is clinically relevant in aging because prolonged dysregulation of stress physiology may affect sleep quality, appetite, energy balance, and body composition. In true cortisol excess states such as Cushing's syndrome, patients may develop central weight gain, thin arms and legs, muscle weakness, easy bruising, and wide purple striae. Those are very different from the broad, nonspecific complaints often attributed to "high cortisol" in wellness culture. NIDDK describes these more specific patterns as the clinical picture of genuine cortisol excess.

From a practical aesthetic perspective, poor sleep, abdominal fat gain, inflammation-related complaints, and slower recovery may all coexist with chronic stress, but that still does not mean the patient has a diagnosable cortisol disorder. The clinician should be careful not to blur the line between stress-related symptoms and endocrine disease.

Clinical Interpretation in Practice

In practice, cortisol testing should be reserved for patients with a real clinical reason for endocrine evaluation. This includes suspicion of adrenal insufficiency, glucocorticoid-induced adrenal suppression, pituitary disease, or true Cushing's syndrome. NIDDK notes that adrenal insufficiency is commonly evaluated with morning cortisol testing and, when needed, ACTH stimulation testing, which is the most commonly used diagnostic test.A patient who is simply stressed, tired, or sleeping poorly does not automatically need cortisol testing. A better first step may be a careful history, medication review, sleep review, and general medical assessment. Cortisol should be tested when the symptoms and context suggest a true disorder, not just because the patient uses "cortisol" as a general explanation.

Distinguishing Evidence-Based Endocrinology From Unsupported Claims

One of the most important tasks in this chapter is drawing a clear line between evidence-based endocrinology and unsupported anti-aging language.

"Adrenal fatigue" is widely used in commercial wellness settings, but it is not a medically recognized endocrine diagnosis.

Cleveland Clinic's endocrinology-focused patient education makes this explicit: adrenal fatigue is not recognized as a true adrenal disorder, although real adrenal diseases absolutely exist.

This distinction matters because patients with true adrenal insufficiency can become seriously ill, and patients with true Cushing's syndrome can have significant morbidity. Overusing vague terms may delay proper diagnosis or lead to unnecessary supplements, false reassurance, or inappropriate treatment plans.

Practical Management Approach

For most patients in aesthetic practice, the first-line approach to stress-related cortisol concerns is not hormone treatment. It is better sleep assessment, stress review, medication review, diet and exercise support, and clarification of whether the symptom pattern is endocrine at all.



If the history suggests true adrenal disease, then formal testing and referral pathways should be used. If the issue is long-term glucocorticoid exposure, the 2024 endocrine guidance on glucocorticoid-induced adrenal insufficiency becomes especially relevant.

A practical workflow is simple:

1. decide whether the complaint is vague stress versus true endocrine suspicion,
2. review steroid exposure and other medication history,
3. look for red-flag symptoms,
4. order morning cortisol and ACTH only when clinically justified,
5. refer when the picture is complex or abnormal.

Practical dosing overview

Cortisol-related treatment should only be initiated in patients with confirmed adrenal insufficiency or clearly defined endocrine pathology, not based on nonspecific symptoms such as fatigue alone. According to the Endocrine Society, diagnosis should be supported by appropriate testing (e.g., morning cortisol and, when needed, ACTH stimulation testing).

For confirmed adrenal insufficiency:

- **Hydrocortisone (preferred):**
  - typically 15–25 mg per day, divided into 2–3 doseslargest dose in the morning
  - smaller dose early afternoon
  - avoid late evening dosing to preserve sleep
- **Alternative** (if needed):Prednisolone: typically 3–5 mg once daily (less physiologic, used selectively)
- Avoid chronic overtreatment, which may lead to Cushingoid effects

What NOT to do (critical in aesthetic practice):

- Do not prescribe corticosteroids for "adrenal fatigue" (not evidence-based)
- Do not treat nonspecific fatigue with glucocorticoids
- Do not initiate therapy without proper diagnostic confirmation

Monitoring and reassessment:

- Monitor clinically (energy, weight, blood pressure, signs of excess)
- Watch for overtreatment: weight gain, hypertension, hyperglycemia, mood changes
- Consider endocrine referral for long-term management

If symptoms are vague and testing is normal, focus on sleep, stress, and lifestyle factors rather than initiating cortisol-based therapy.

Key practical rules

- Aim to mimic normal circadian rhythm, not to "boost energy"
- Use the lowest dose that controls symptoms without causing signs of excess
- Educate patients on stress dosing (illness, surgery, major stress)



Red Flags and Referral Points

Referral or urgent medical evaluation is needed when there is suspicion of adrenal insufficiency, adrenal crisis, true Cushing's syndrome, pituitary disease, or abnormal cortisol testing that requires dynamic endocrine evaluation. NIDDK notes that adrenal crisis is a medical emergency and may cause life-threatening hypotension, low glucose, low sodium, and high potassium. It requires immediate treatment.

Other important referral clues include long-term steroid use with concerning symptoms, unexplained weight loss with dizziness and hypotension, central obesity with muscle weaknessand bruising suggestive of hypercortisolism, or broader pituitary symptoms such as headaches, visual change, and multiple hormonal abnormalities.

Easy-to-Use Cortisol Evaluation Box

When to suspect a real cortisol disorder

- severe fatigue with dizziness or low blood pressure
- long-term glucocorticoid use or recent steroid withdrawal
- unexplained weight loss, nausea, weakness
- central weight gain with bruising, purple striae, proximal muscle weakness
- pituitary-type features or multiple hormone abnormalities

First practical tests when justified

- morning serum cortisol
- ACTH
- CBC
- CMP
- electrolytes

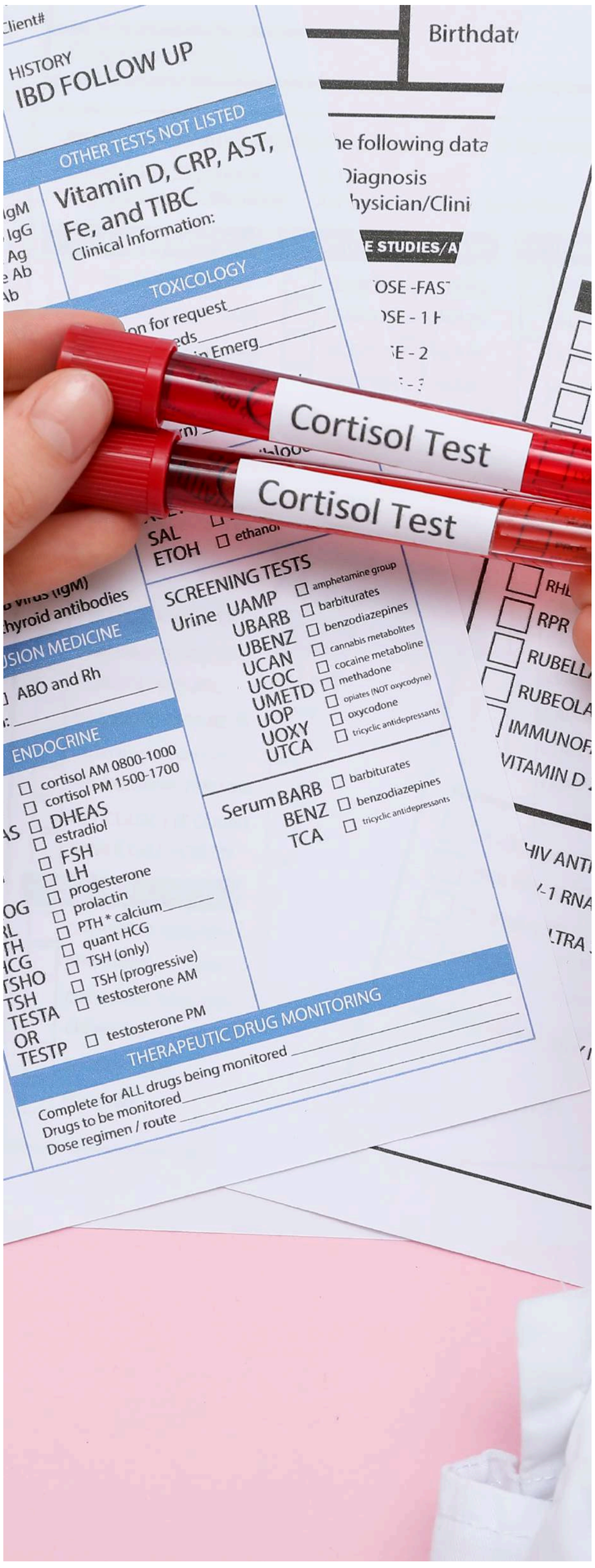
Do not routinely test cortisol for

- general stress
- vague tiredness alone
- "burnout" without red flags
- cosmetic aging complaints without endocrine signs

These points are consistent with mainstream endocrine and NIDDK guidance on adrenal insufficiency and cortisol-related disorders.

Quick Clinical Takeaway

Cortisol matters, but it should be handled carefully. Real cortisol disorders are important and sometimes dangerous, while many popular "cortisol imbalance" claims are too vague to be clinically useful. The safest approach is to reserve testing for patients with a true endocrine pattern, avoid unsupported adrenal-fatigue language, and refer promptly when red flags appear.



Simple Test Approach — Cortisol

When to test cortisol

Test only if there is real suspicion of adrenal disease, such as:

- severe fatigue with dizziness or low blood pressure
- long-term steroid use or recent steroid withdrawal
- unexplained weight loss, nausea, weakness
- possible Cushing pattern: central weight gain, easy bruising, purple striae, proximal muscle weakness

First-line tests

- Morning serum cortisol
- ACTH
- CBC
- CMP / electrolytes

Best confirmatory test

- ACTH stimulation test is the test used most often to diagnose adrenal insufficiency.

Do not routinely test for

- general stress
- burnout
- vague fatigue alone
- “adrenal fatigue”

Quick Table

Situation	Test approach	Treatment approach
Suspected adrenal insufficiency	Morning cortisol, ACTH, electrolytes, then ACTH stimulation test	Hydrocortisone 15–25 mg/day in divided doses
Suspected steroid-induced suppression	Review steroid history, consider morning cortisol	Taper steroids carefully; do not stop abruptly
Adrenal crisis	Emergency clinical diagnosis + urgent labs	Immediate IV steroids + IV saline ± dextrose
Suspected Cushing syndrome	Endocrine workup / specialist testing	Refer

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MELATONIN

Melatonin is a hormone produced by the brain in response to darkness. Its main role is to help regulate circadian timing, meaning the body's internal 24-hour clock, and to support sleep onset.

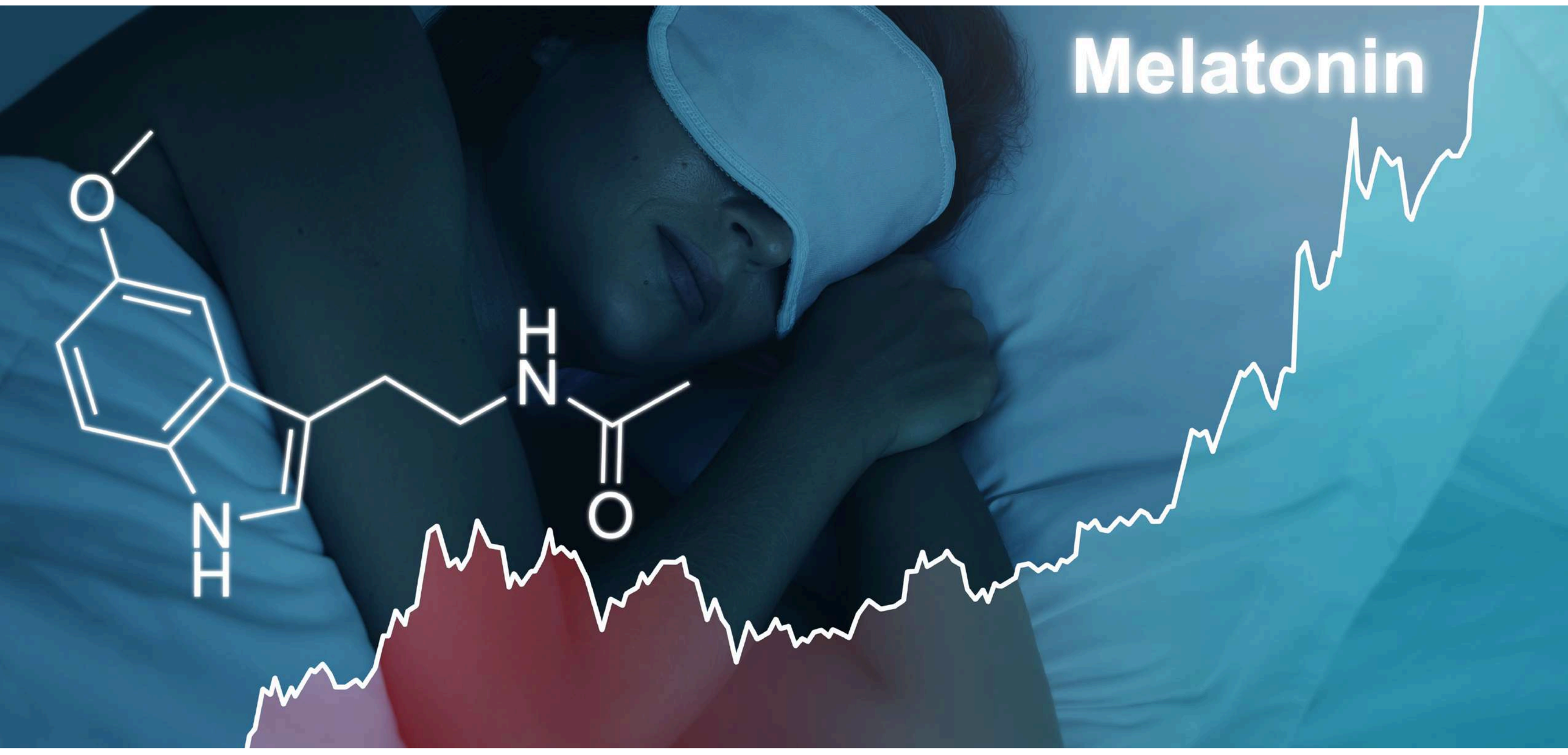
Light exposure at night can suppress melatonin production, which is one reason screen use, bright light, and irregular schedules can worsen sleep.

Physiology and Circadian Biology

Melatonin should be understood more as a timing hormone than a heavy sedative. It signals that it is biologic night and helps coordinate circadian rhythm, especially sleep timing. This is why it is often more useful in circadian misalignment and sleep-onset problems than in every type of insomnia.

Sleep Regulation and Repair

Melatonin may help patients who struggle with sleep onset or circadian rhythm disruption, but it is not a replacement for good sleep habits or full insomnia care. The evidence base is stronger for circadian rhythm sleep-wake disorders than for routine chronic insomnia, and sleep history remains more important than lab testing.



Melatonin and Healthy Aging

Melatonin is often discussed in healthy-aging conversations because sleep quality strongly affects recovery, energy, mood, and the way patients experience aging. However, current official sources emphasize melatonin mainly for circadian timing and sleep-related use, not as a broad anti-aging therapy.

Clinical Relevance in Restorative Protocols

In practical anti-aging or restorative care, melatonin is most relevant when the patient has difficulty falling asleep, circadian disruption, or sleep timing problems. It is less helpful when the real issue is sleep apnea, pain, severe anxiety, depression, stimulant use, or poor sleep hygiene. In those cases, melatonin may be only a small part of the plan or not the right tool at all.

Patient Selection

Melatonin is most reasonable for patients with:

- delayed sleep timing
- jet lag or schedule-shift problems
- mild sleep-onset difficulty
- circadian rhythm disruption

It is less appropriate as a reflex treatment for every tired patient. Sleep history should come first, and medication review matters because supplements can interact with other drugs. NCCIH notes that melatonin can interact with medicines and that long-term safety data are limited.

Practical Use in Sleep-Focused Protocols

A practical starting approach in adults is to begin low. Common adult use is around 0.5 to 3 mg before bedtime, and many people do not need more than 5 mg. Sleep Foundation's 2025 clinical review notes that most adults are advised to start with 0.5 to 1 mg, with a typical range of 1 to 3 mg, usually taken about 30 minutes before bedtime.

For circadian rhythm problems, timing often matters more than dose. AASM guidance supports strategically timed melatonin for certain circadian rhythm sleep-wake disorders, especially non-24-hour sleep-wake disorder in blind adults.

Practical dosing overview

Melatonin can be used as a short-term or supportive intervention for sleep disturbance, particularly in patients with circadian rhythm disruption or difficulty with sleep onset. It should not replace proper sleep assessment or management of underlying causes.

Common practical approaches include:

- Sleep-onset difficulty:

typically 0.5–3 mg taken 30–60 minutes before bedtime

- Circadian rhythm delay (e.g., late sleepers):

lower doses (e.g., 0.5–1 mg) taken earlier in the evening may be more effective

- Older adults or sensitive patients:

start low (0.5–1 mg) to reduce risk of next-day sedation

Key practical rules:

- Start low dose first, then titrate only if needed
- Higher doses do not necessarily improve efficacy and may increase side effects
- Use alongside sleep hygiene optimization (timing, light exposure, routine)
- Avoid combining with other sedatives unless clinically appropriate

Monitoring and reassessment:

- Reassess after 2–4 weeks
- Continue only if there is clear subjective improvement in sleep
- Watch for side effects: daytime drowsiness, dizziness, headache

According to the National Center for Complementary and Integrative Health, melatonin is generally well tolerated in the short term, but long-term safety data are limited.

If sleep does not improve, reassess for:

- menopause-related symptoms
- stress or anxiety
- poor sleep habits
- other medical or psychological causes

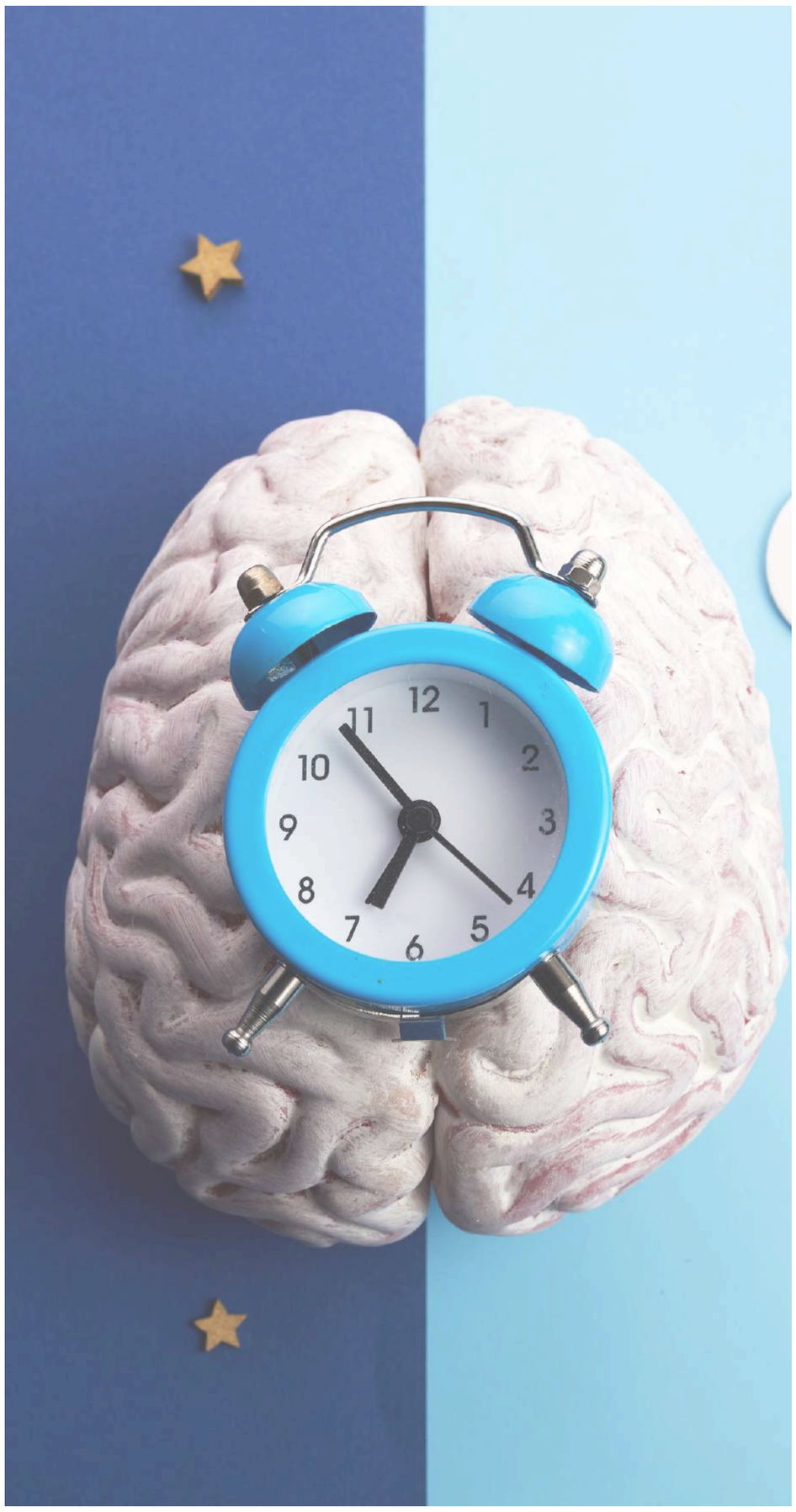
Avoid using melatonin as a long-term substitute for proper diagnosis and treatment of sleep disorders.



Safety Considerations

Short-term melatonin use appears to be safe for most people, but official NIH sources note that long-term safety information is still limited. Common side effects can include drowsiness, headache, dizziness, and nausea. Because it may cause sleepiness, patients should also be cautious about driving or activities requiring alertness after taking it.

Routine melatonin blood testing is usually not needed. In most aesthetic or restorative settings, melatonin is handled clinically through sleep history, timing problems, and response to treatment rather than through lab-based diagnosis. This is a practical clinical inference supported by the fact that major guidance focuses on symptom pattern and circadian disorder diagnosis, not routine melatonin serum testing.



Quick Clinical Takeaway

Melatonin is best viewed as a sleep-timing aid rather than a universal sleep cure or anti-aging hormone. It is most useful for selected patients with sleep-onset or circadian problems, usually at low doses, with careful attention to timing and overall sleep assessment.

Quick-Use Protocol Table

Situation	Practical approach
Mild sleep-onset difficulty	Start low, often 0.5–1 mg before bedtime; increase only if needed.
Common adult use range	Usually 1–3 mg, often about 30 minutes before bedtime.
Higher doses	Many adults do not need more than 5 mg.
Circadian rhythm disorder	Focus on timing of melatonin, not just dose; use strategically timed dosing when clinically appropriate.
Jet lag / schedule shift	Consider short-term timed use plus light management and sleep scheduling.
Main side effects	Drowsiness, headache, dizziness, nausea.
Avoid casual long-term use without review	Long-term safety is not well established.
Do not rely on melatonin alone when	Suspected sleep apnea, major psychiatric symptoms, medication-related insomnia, pain, or poor sleep hygiene are the main drivers.

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GROWTH HORMONE AND IGF-1

Growth hormone, or GH, and insulin-like growth factor 1, or IGF-1, are often discussed in anti-aging medicine because they are associated with tissue growth, metabolism, body composition, and recovery. This has led to a great deal of commercial interest, but the evidence-based clinical use of GH is much narrower than many anti-aging claims suggest. The Endocrine Society notes that recombinant human GH is approved for adults with proven growth hormone deficiency, not for normal age-related decline or general anti-aging use.

Physiology and Biological Role

GH is produced by the pituitary gland and acts both directly and indirectly through IGF-1, which is mainly generated in the liver in response to GH signaling. Together, GH and IGF-1 influence growth, protein metabolism, fat metabolism, tissue repair, and aspects of body composition.

Because GH secretion fluctuates through the day, IGF-1 is generally the more stable marker used in clinical evaluation. NIDDK states that IGF-1 is a reliable way to track GH activity in the body, particularly in the evaluation of acromegaly.



GH/IGF-1 Changes With Age

GH secretion decreases with age, and IGF-1 levels may also decline. However, age-related decline alone does not equal adult growth hormone deficiency. The Endocrine Society's aging review states clearly that there are no approved therapies for reversing the age-associated decline of GH secretion and that GH secretagogues are not approved as anti-aging agents.

This distinction is critical in practice. A patient may have lower GH-related signaling than they did in youth, but that does not mean they should automatically receive GH therapy. Clinical treatment is reserved for proven deficiency, not for ordinary aging.

Body Composition, Recovery, and Tissue Repair

GH and IGF-1 affect lean body mass, fat metabolism, and tissue turnover, which is why they are frequently linked to body-composition and recovery discussions. In adults with true growth hormone deficiency, treatment can improve body composition, exercise capacity, skeletal

integrity, and quality of life, according to the Endocrine Society guideline.

That said, the same guideline also emphasizes careful diagnosis because these benefits apply to adults with genuine deficiency, not to every patient who wants improved recovery or a more youthful appearance. In healthy adults, GH use has shown mixed results, and official endocrine patient guidance says more research is needed to fully understand benefits and risks in this setting.

Clinical Interpretation and Limitations

The main limitation in GH practice is diagnostic overreach. Many symptoms often blamed on "low GH," such as fatigue, increased fat, slower recovery, and reduced vitality, are nonspecific.They may reflect sleep problems, aging, inactivity, metabolic disease, or other endocrine issues rather than true GH deficiency.

The Endocrine Society recommends growth hormone stimulation testing for suspected adult GH deficiency, because random GH measurement is not useful due to pulsatile secretion. IGF-1 is helpful, but it is not always enough by itself to confirm deficiency in adults.

In contrast, if GH excess is suspected, IGF-1 is the preferred initial blood marker. NIDDK notes that a high IGF-1 level suggests acromegaly, and further confirmation may involve GH testing during an oral glucose tolerance test.

Therapeutic Rationale

The therapeutic rationale for GH in adults is narrow and specific: to replace GH in adults with proven growth hormone deficiency who do not have contraindications. The Endocrine Society guideline states that such patients should be offered GH replacement, and that treatment benefits body composition, exercise capacity, skeletal integrity, and quality of life. This is very different from using GH for anti-aging, muscle enhancement, or cosmetic rejuvenation. The Endocrine Society's aging review explicitly states that GH and secretagogues are not approved as anti-aging agents.

Appropriate Clinical Context

GH therapy belongs in a medically supervised endocrine context, usually when adult growth hormone deficiency has been properly confirmed. It is not a routine treatment in aesthetic practice. If a patient has clear pituitary disease, prior pituitary surgery, radiation history, multiple pituitary hormone deficiencies, or strong specialist suspicion, then GH deficiency evaluation may be appropriate. Otherwise, vague anti-aging complaints are not a good reason to start GH-focused treatment.



In the opposite direction, if there are signs of possible GH excess, such as enlarging hands or feet, jaw changes, or other acromegaly-like features, that should prompt endocrine workup and referral rather than casual anti-aging management. NIDDK notes that high IGF-1 suggests acromegaly and that most cases are related to pituitary adenomas.

Practical dosing overview

Growth hormone (GH) therapy should be reserved for patients with confirmed growth hormone deficiency, typically diagnosed through appropriate testing and often in collaboration with an endocrinologist. It should not be used for general anti-aging, body composition, or performance enhancement in otherwise healthy individuals.
According to the Endocrine Society, treatment should be individualized and guided by clinical response and IGF-1 levels.
For confirmed adult GH deficiency:

- **Somatropin (recombinant GH):**

typically started at low doses (e.g., 0.1–0.3 mg/day subcutaneously)

  - gradual titration based on response and IGF-1 levels
  - lower starting doses in older patients or those with higher sensitivity

Key practical rules:

- Aim to maintain IGF-1 within age-adjusted normal range, not supraphysiologic levels
- Start low and titrate slowly to minimize side effects
- Avoid “anti-aging” or cosmetic use without clear medical indication
- Use caution in patients with diabetes, cancer history, or edema-prone states

Common side effects (dose-related):

- fluid retention / edema
- joint pain / arthralgia
- carpal tunnel symptoms
- insulin resistance

Monitoring and reassessment:

- Monitor IGF-1 levels to guide dosing
- Assess for clinical benefit (energy, body composition, recovery)
- Watch for signs of overtreatment
- Reassess need for ongoing therapy periodically

GH therapy should be avoided in patients with active malignancy and used cautiously in those with metabolic risk factors.
If GH deficiency is not clearly established, avoid treatment and instead focus on sleep, nutrition, and overall metabolic health, which have a far greater evidence base in aesthetic and anti-aging practice.

Risk Profile and Practical Cautions

GH treatment is not risk-free. The Endocrine Society guideline emphasizes individualized dosing and careful monitoring because side

effects can occur, especially when doses are too high. The practical clinical concern is that overtreatment may increase fluid retention-related symptoms, joint discomfort, and other intolerance issues, while underdiagnosed comorbidity may complicate therapy.From an anti-aging perspective, the biggest caution is not simply side effects. It is inappropriate use. GH should not be presented as a routine restorative hormone for healthy aging adults,
because official endocrine guidance does not support that use.

Monitoring and Safety Boundaries

Monitoring is based on symptoms, IGF-1 response, tolerability, and appropriate endocrine follow-up. The Endocrine Society's dosing guidance for GH-deficient emerging adults advises low starting doses with titration while monitoring IGF-1 levels, aiming to keep them in a safe target range rather than aggressively escalating dose.
One society dosing document notes that if GH has been interrupted for 6–12 months, restarting at about 300 micrograms per day may be prudent at the low end of adult dosing, with titration based on IGF-1 and clinical response.

Because GH therapy is specialist territory, the safety boundary in aesthetic medicine is clear: suspect it, recognize it, and refer when appropriate. Routine GH prescribing for aging alone falls outside evidence-based anti-aging practice.

Quick Clinical Takeaway

GH and IGF-1 are biologically important, but their clinical use is far narrower than anti-aging marketing suggests. True GH therapy is for adults with proven deficiency, not for routine age management. In practical aesthetic care, the safest approach is to recognize when GH/IGF-1 issues may be relevant, use IGF-1 appropriately, and refer endocrine-level cases rather than treating normal aging as GH deficiency.

Quick-Reference Clinical Summary Table

Topic	Practical summary
Main role	GH acts directly and through IGF-1 to influence growth, metabolism, tissue repair, and body composition.
Best routine blood marker	IGF-1 is more useful than random GH because GH secretion is pulsatile.
Age-related decline	GH declines with age, but there are no approved therapies to reverse normal age-related GH decline.
Who may need treatment	Adults with proven growth hormone deficiency and no contraindications.
Who should not be treated casually	Healthy adults seeking anti-aging, physique enhancement, or general rejuvenation.
How GHD is diagnosed	Usually requires **stimulation testing**; random GH is not useful.
How GH excess is screened	Start with **IGF-1**; if high and clinically suspicious, evaluate for acromegaly.
General adult dosing concept	Start **low and titrate** based on IGF-1 and response; one Endocrine Society dosing document suggests about **300 mcg/day** as a low-end adult restart point in selected situations.
Main safety principle	Keep therapy within specialist, evidence-based boundaries and monitor IGF-1 and tolerance.
Best practical rule	In anti-aging settings, **suspect carefully, diagnose properly, and refer appropriately**.

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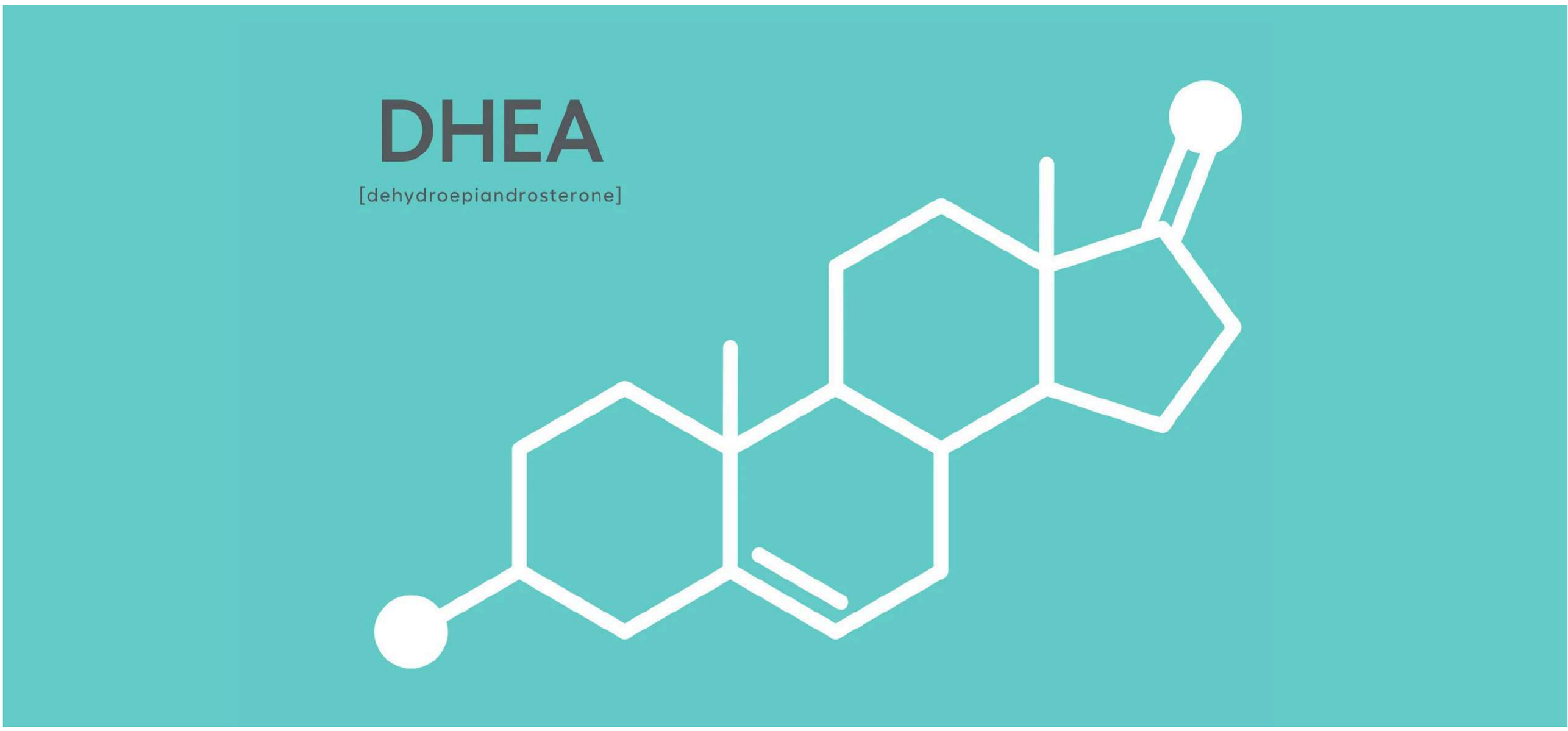
DHEA AND PREGNENOLONE

DHEA and pregnenolone are frequently mentioned in anti-aging medicine, but they do not have the same level of evidence or clinical clarity as testosterone, estrogen, progesterone, or thyroid hormone. DHEA is a naturally occurring adrenal hormone precursor that can be converted into androgens and estrogens, and its production declines with age. However, the significance of that decline is not always clear, and anti-aging claims for routine DHEA use remain unproven. Pregnenolone is also discussed as a "hormone precursor," but clinical evidence for routine supplementation is limited, and it should be approached cautiously rather than casually.

Physiology and Age-Related Decline

DHEA and its sulfated form, DHEA-S, are produced mainly by the adrenal glands. DHEA levels decrease with age, but official endocrine and NIH sources note that it remains uncertain whether replacing DHEA improves aging-related symptoms in a meaningful way.

Pregnenolone also sits upstream in steroid hormone synthesis, but that does not mean low-normal or age-related decline automatically requires supplementation. In practical care, these hormones should not be treated as universal "youth hormones."



Potential Clinical Applications

The most defensible clinical discussion around DHEA is in selected contexts, particularly adrenal insufficiency and some sexual-health discussions, but even there the evidence is mixed.

The Endocrine Society's aging review notes that DHEA supplementation at 25 to 50 mg/day in older adults has restored DHEAS levels to younger ranges, but benefits have generally been small and inconsistent.

There is some discussion of DHEA use in women with adrenal insufficiency, especially around sexual interest or well-being, but this is not the same as recommending DHEA broadly in routine anti-aging practice.

For pregnenolone, routine anti-aging use is even less evidence-based. It is better viewed as an area of limited evidence rather than a standard clinical therapy.

Limitations of Evidence

This is the key issue with both DHEA and pregnenolone: the evidence is limited, inconsistent, and much weaker than for the core hormone therapies. NCCIH states that it is uncertain whether DHEA is useful for menopause symptoms, and that long-term safety is unknown. Endocrine Society aging material also describes DHEA results as modest and inconsistent rather than strongly therapeutic.

For pregnenolone, evidence is even less robust, which means it should not be presented to patients as a proven restorative or anti-aging treatment.

Patient Selection

If DHEA is considered at all, it should be in carefully selected patients after proper history, symptom review, and lab context. It should not be a default supplement for fatigue, vague low mood, weight change, or "hormone balance."Extra caution is needed in patients with hormone-sensitive cancer risk, pregnancy, breastfeeding, acne-prone patients, and those with androgen-sensitive symptoms. Mayo Clinic notes that DHEA may raise androgen levels and may increase the risk of hormone-sensitive cancers, including breast, ovarian, and prostate cancers.

Pregnenolone should also be approached cautiously because the supplement market is variable and evidence-based indications are unclear.

Practical dosing overview

DHEA and pregnenolone may be considered as adjunctive therapies in selected patients, but they are not first-line treatments and should not replace established hormone therapies. Evidence for routine use in anti-aging or aesthetic practice remains limited and inconsistent, so careful patient selection and monitoring are essential.

Common practical approaches include:

- **DHEA**:typically 25–50 mg daily
  - lower starting dose (10–25 mg) in sensitive patients or women
  - may be considered in selected cases of adrenal insufficiency or low DHEA-S
- **Pregnenolone**:typically 10–30 mg daily
  - start low (5–10 mg) and titrate cautiously based on response

Key practical rules

- Use only in well-selected patients with suggestive symptoms and/or low levels
- Start low dose and reassess before increasing
- Avoid combining with multiple other hormone therapies without clear rationale
- Do not present as “anti-aging” or “hormone optimization” solutions

Monitoring and reassessment:

- Monitor clinical response first (energy, mood, cognitive symptoms)
- Consider periodic DHEA-S levels if using DHEA
- Watch for androgenic side effects (especially with DHEA):
  - acne
  - oily skin
  - hair changes

According to the Endocrine Society, routine use of DHEA for general anti-aging is not supported by strong evidence, and long-term safety remains unclear.

When to avoid:

- hormone-sensitive cancers
- unexplained androgenic symptoms
- patients already on multiple hormone therapies without clear indication

If symptoms are nonspecific (fatigue, low mood), prioritize sleep, stress, metabolic health, and primary hormone evaluation before initiating these therapies.

Monitoring and Patient Counseling

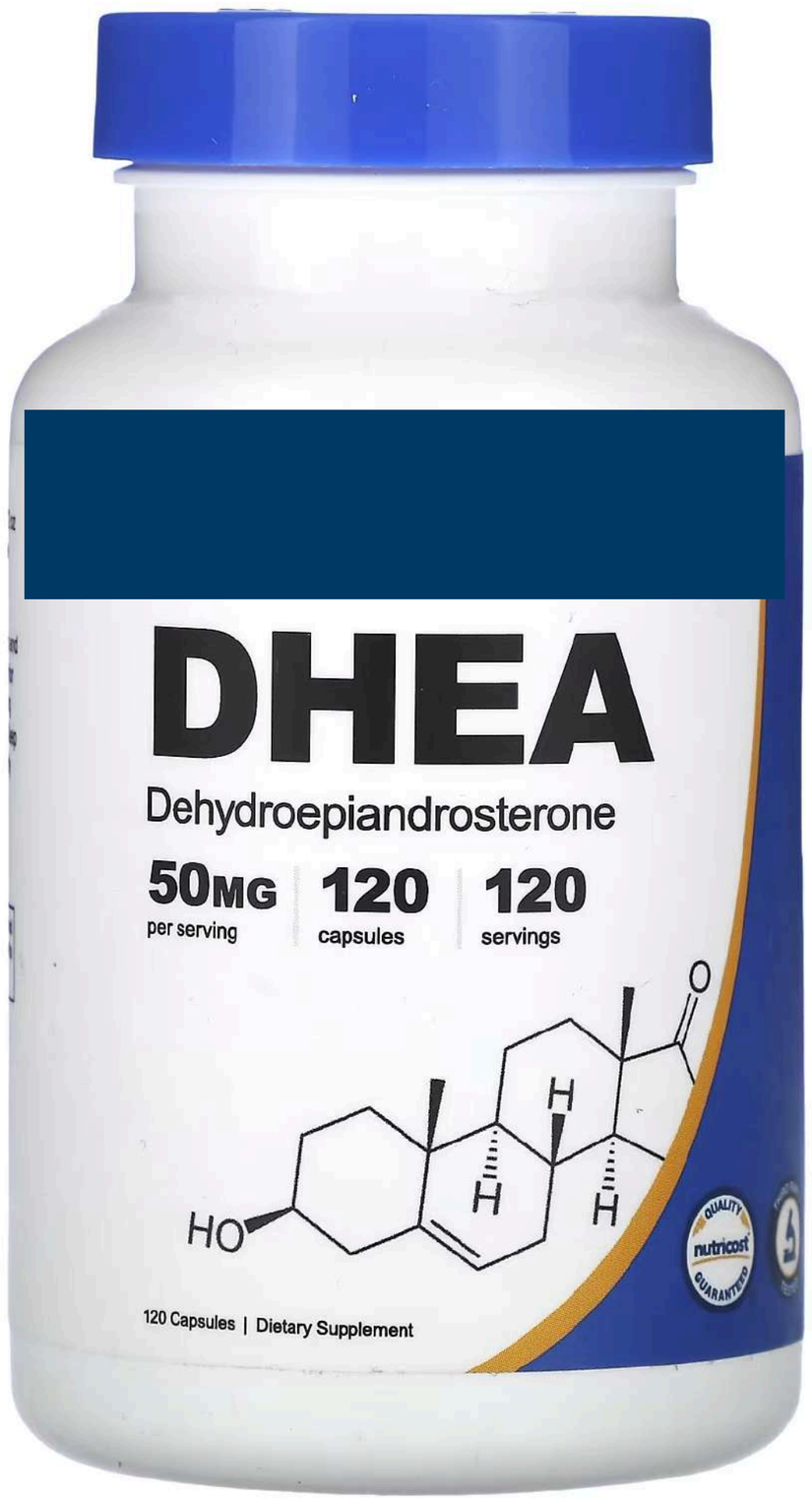
Patients should be counseled honestly that:

- evidence is limited
- benefits may be small or absent
- long-term safety is uncertain
- these supplements are not equivalent to established hormone replacement therapies

If DHEA is used, a practical monitoring approach may include:

- symptom review
- side-effect review
- repeat DHEA-S when clinically relevant
- attention to androgenic effects such as acne, oily skin, or hair changes

Patients should also be told that “natural” does not mean risk-free. NCCIH and Mayo Clinic both emphasize safety concerns and possible drug interactions.

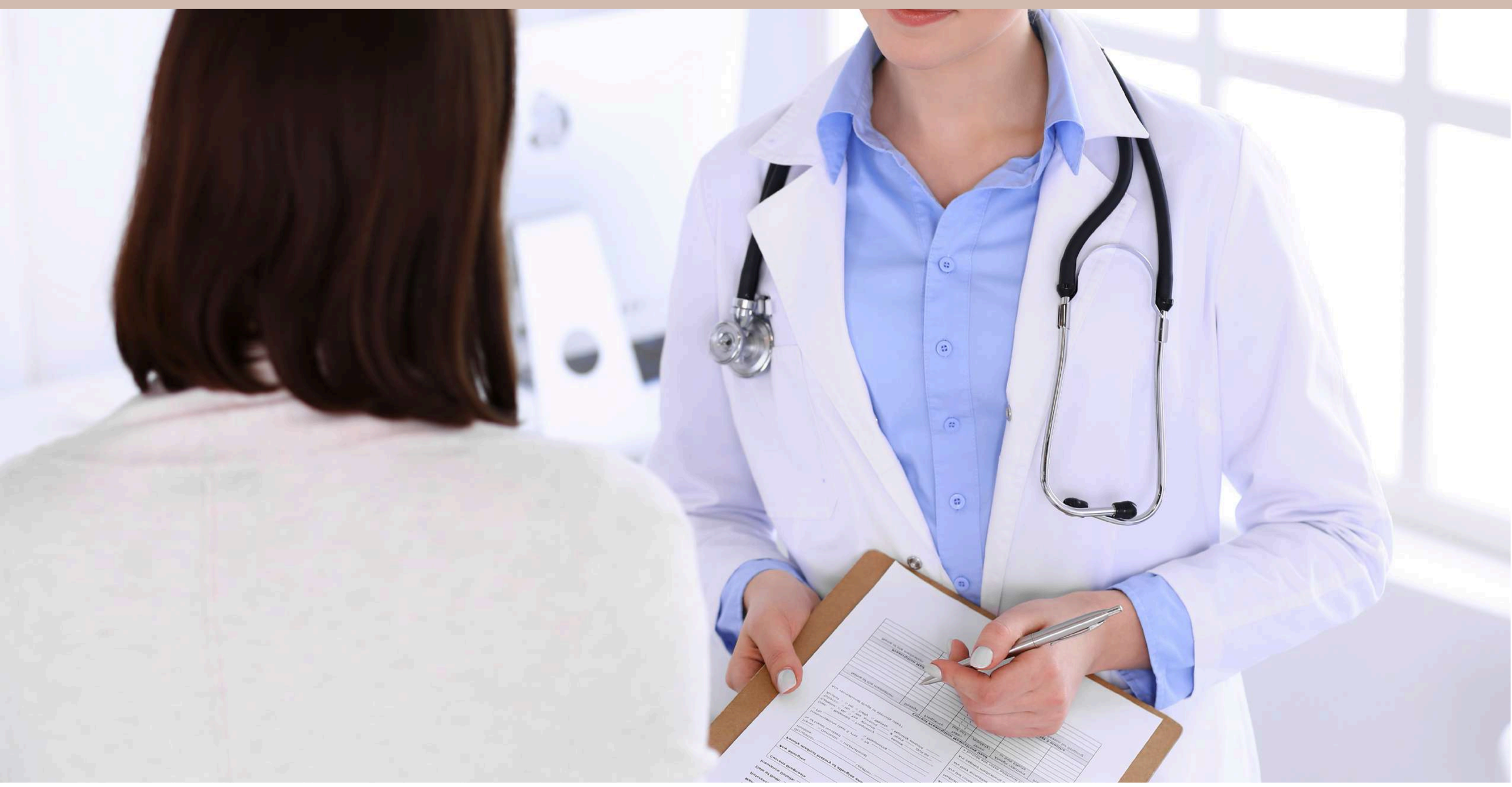


Quick Clinical Takeaway

DHEA and pregnenolone may sound attractive in anti-aging medicine because they are hormone precursors, but the evidence is limited and the marketing often goes far beyond the science. If used at all, they should be used selectively, cautiously, and with honest counseling about uncertain benefit and incomplete long-term safety data.

Quick-Reference Use and Caution Table

Topic	Practical summary
Main hormone	DHEA is an adrenal precursor hormone that declines with age.
Evidence strength	Limited and inconsistent for routine anti-aging use.
Common studied DHEA range	25–50 mg/day in some studies.
Best possible niche use	Selected cases, especially some adrenal-insufficiency-related contexts, not broad anti-aging prescribing.
Do not present as	Proven anti-aging, energy, muscle, or rejuvenation therapy.
Major cautions	Hormone-sensitive cancer risk, androgenic side effects, pregnancy, breastfeeding.
Pregnenolone	Even weaker clinical evidence; use cautiously and avoid overselling benefit.
Best counseling point	Benefits are uncertain, safety is not fully established, and these are not first-line hormone therapies.



Part IV. Practical Treatment Design

This section moves from hormone-specific knowledge into everyday clinical use. Once the clinician has identified the likely hormonal issue, the next step is deciding how to treat it. That means choosing the best route of therapy, matching the treatment to the patient's symptoms and labs, considering risk factors such as clotting risk or absorption problems, and setting realistic goals before treatment begins. In practical care, the success of hormone therapy often depends as much on route selection, adherence, and follow-up planning as it does on the diagnosis itself.

The aim of this part is to keep treatment design simple, structured, and clinically usable. Rather than treating every patient the same way, the clinician should choose the route and plan that best fit the patient's symptom profile, safety considerations, convenience, and likelihood of adherence. This is especially important in hormone therapy, where the same hormone can often be delivered in more than one way, but the risks, absorption, and monitoring needs may differ meaningfully by route.

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ROUTES OF THERAPY AND TREATMENT PLANNING

Choosing the right hormone is only one part of treatment design. The route of administration often determines how consistently the hormone is absorbed, how convenient the regimen feels to the patient, how easy it is to monitor, and in some cases what safety risks are involved. In menopausal hormone therapy, for example, oral and transdermal routes do not carry identical thrombotic risk. In testosterone therapy, transdermal and injectable preparations differ in convenience, pharmacokinetics, and adherence patterns. In thyroid treatment, oral levothyroxine remains standard, but absorption is highly dependent on timing and interactions.

Oral, Injectable, Transdermal, and Sublingual Forms

Oral therapy is often the simplest route for patients because it is familiar and easy to prescribe.

It is standard for levothyroxine and commonly used in some menopausal hormone regimens.

The main drawback is that oral absorption can be affected by food, coffee, vitamins, and interacting medications. In estrogen therapy, oral administration also has more hepatic first-pass effect and is associated with higher venous thromboembolism risk than transdermal therapy.



Injectable therapy is commonly used for testosterone and specialist endocrine therapies. It can be effective and bypasses gastrointestinal absorption issues, but it may produce more fluctuation depending on the formulation and interval, and some patients dislike injections or struggle with regular administration. Endocrine Society material notes that testosterone products are available in injectable forms alongside oral and transdermal options.

Transdermal therapy includes patches, gels, sprays, and topical preparations. This route can be especially useful when a steadier delivery profile is desired or when thrombotic risk makes oral estrogen less attractive. NICE states that VTE risk is not increased with transdermal HRT, while oral HRT is associated with increased VTE risk. ACOG similarly notes that orally administered estrogen may exert a prothrombotic effect, whereas transdermal estrogen has little or no such effect.

Sublingual and related rapid-absorption routes are discussed in some hormone practices, but they are not the main standard route for most evidence-based mainstream hormone replacement regimens. Their use is generally more limited and product-specific.

In a practical aesthetic-medicine book, they can be acknowledged as an option in selected settings, but they should not be presented as the default route for core replacement therapy. This is a practical synthesis based on the fact that the major guideline-supported routes emphasized for the core therapies here are oral, transdermal, and injectable.

Advantages and Disadvantages of Each Form

The best route is not the same for every patient. Oral therapy is simple and familiar but is more vulnerable to absorption issues and, in the case of estrogen, can carry higher thrombotic risk than transdermal therapy. Transdermal therapy avoids first-pass hepatic metabolism and may be preferable when clot risk is a concern, but it requires proper application and patient compliance. Injectable therapy can be useful when absorption reliability matters or when longer dosing intervals are preferred, but it may be less convenient for needle-averse patients and may require more structured follow-up.

Absorption, Compliance, and Convenience

Absorption is one of the most practical reasons route choice matters.

Levothyroxine is the clearest example: ATA sources note that absorption can decrease when it is taken with food, vitamins, coffee, or certain medications, and inconsistent use is a common cause of unstable thyroid levels. That means oral thyroid therapy works well, but only if patients follow instructions carefully.

Compliance is equally important. A theoretically ideal route is not useful if the patient will not follow it. Some patients prefer a daily gel to avoid injections. Others prefer injections because they do not want a daily routine. Some menopausal patients prefer a patch because of clot-risk concerns or convenience, while others want oral therapy because it feels simpler. Good treatment planning therefore includes asking what the patient is realistically able and willing to do.

Choosing the Right Route for the Patient

Route choice should be individualized. In a patient needing menopausal hormone therapy with elevated VTE concern, transdermal estrogen is often the safer practical option than oral estrogen. In a patient with thyroid disease and erratic absorption because of timing problems or interacting substances, more attention must be paid to oral dosing habits before assuming treatment failure.



In a patient with testosterone deficiency, either transdermal or injectable treatment may be reasonable depending on preference, monitoring practicality, and how well the patient tolerates fluctuation versus daily application.

Matching Therapy to Symptoms, Labs, and Risk Profile

Treatment planning should begin with the main clinical goal. A menopausal patient with hot flashes and sleep disruption may need systemic therapy, while a patient with isolated vaginal dryness may do better with local treatment rather than full systemic exposure. A patient with hypothyroidism needs replacement of deficient hormone, not a wellness-style supplement approach. A man with confirmed testosterone deficiency needs a route that can achieve physiologic replacement and allow follow-up monitoring, not just the most convenient product on paper. Risk profile modifies that choice. Thrombotic history, liver disease, absorption problems, fertility concerns, hematocrit, prostate-related issues, and comorbid disease all matter. Route selection is therefore not only about convenience but also about safety.

Setting Realistic Treatment Goals

Before treatment begins, the clinician should define what success actually means. That may be reduction of hot flashes, improvement in vaginal comfort, stabilization of thyroid labs and fatigue, or better libido and vitality in properly diagnosed testosterone deficiency.

The goal should be symptom improvement and physiologic control, not “anti-aging transformation.” This helps protect against overtreatment, disappointment, and repeated unnecessary dose escalation.

Quick Clinical Takeaway

Good hormone treatment design is not about using the most popular route. It is about choosing the route that best matches the patient’s symptoms, lab pattern, risk profile, and ability to adhere. In many cases, the smartest treatment choice is the one that is simplest, safest, and
easiest to monitor.



Treatment Approach Algorithms

1. Menopausal symptoms

- Main issue hot flashes / night sweats→ consider systemic therapy
- Higher VTE concern→ prefer transdermal over oral when appropriate
- Main issue vaginal dryness / dyspareunia only→ consider local therapy first

2. Testosterone deficiency

- Confirmed symptoms + repeat low early-morning testosterone → choose transdermal or injectable based on adherence, tolerance, and monitoring practicality
- Fertility plans / major contraindications → do not routinely start; reassess or refer

3. Thyroid replacement

- Confirmed hypothyroid pattern→ use oral levothyroxine as standard
- Poor control despite treatment→ first review timing, food, coffee, vitamins, and interacting medications before assuming failure

Quick Route Selection Table

Route	Best practical use	Main advantage	Main drawback
Oral	Thyroid replacement, some menopausal regimens	Familiar, simple	Absorption interactions; oral estrogen has higher VTE risk than transdermal
Transdermal	Menopausal hormone therapy, testosterone in selected patients	Avoids first-pass effect; useful when clot risk matters	Requires proper application and adherence
Injectable	Testosterone and specialist endocrine therapies	Bypasses GI absorption; useful when longer intervals preferred	Needles, fluctuation, structured follow-up
Sublingual /similar	Selected niche use	Fast absorption in some settings	Less central in mainstream replacement protocols

Easy-to-Use Treatment Planning Box

Before choosing a route, ask:

1. What is the main symptom target?
2. What do the labs actually support?
3. Does the patient have clotting, liver, absorption, or fertility concerns?
4. Which route is safest?
5. Which route is realistic for this patient to follow consistently?
6. What outcome will define success in 8–12 weeks?

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DOSE ADJUSTMENT, MONITORING, AND FOLLOW-UP

This chapter should function as a working follow-up guide. The basic rule is simple: do not increase a dose just because a patient says they still feel "not optimal." Reassess in a structured way: confirm adherence, check timing and route, review side effects, repeat the right labs at the right interval, and then decide whether to continue, adjust, pause, or refer. For testosterone, the Endocrine Society advises reassessment at 3–12 months after starting and then annually, with serum testosterone checked at 3–6 months, aiming for the mid-normal range, and hematocrit checked at baseline, 3–6 months, and then annually.

For menopausal hormone therapy, NICE quality standards recommend review at 3 months after starting and then at least annually. For levothyroxine in primary hypothyroidism, NICE recommends measuring TSH every 3 months until stable, then once yearly.

Practical dose-adjustment rule

At follow-up, ask four questions in this order:

1. Is the diagnosis still correct?
2. Is the patient taking the treatment correctly and consistently?
3. Have symptoms improved, stayed the same, or worsened?



4. Do the follow-up labs support increasing, maintaining, or reducing the dose?

This matters because symptoms alone are often misleading. Thyroid symptoms are nonspecific, and NICE specifically advises aiming to keep TSH within the reference range, avoiding dose increases that suppress TSH or cause thyrotoxicosis. Testosterone therapy should be titrated toward symptom improvement plus mid-normal serum testosterone, not toward supraphysiologic levels.

A. Testosterone Follow-Up

When to review

- First review: 3–6 months
- Then: annually if stable

What to check

- Symptoms: libido, erections, energy, mood, exercise tolerance
- Side effects: acne, edema, irritability, sleep apnea worsening
- Labs:
  - Serum testosterone at 3–6 months
  - Hematocrit at baseline, 3–6 months, then annually
  - PSA / prostate monitoring as clinically appropriate

Practical adjustment approach

- Symptoms improved + testosterone in target range → continue same dose
- Symptoms not improved + testosterone low → check adherence, timing of blood draw, route issues, then consider dose increase
- Symptoms not improved + testosterone normal → do not automatically escalate; reconsider diagnosis, sleep, mood, obesity, medications
- Hematocrit >54% → stop therapy until hematocrit falls to a safer level and reassess cause

Quick Route Selection Table

Visit	Check	Action
Baseline	Testosterone, CBC/hematocrit, safety screen	Confirm diagnosis before starting
3–6 months	Testosterone + hematocrit + symptoms	Titrate toward mid-normal range
Any visit	Side effects or high hematocrit	Reduce, hold, or reassess
Annual	Testosterone, hematocrit, ongoing risk review	Continue if stable and helpful

B. Menopausal Hormone Therapy Follow-Up

When to review

- First review: 3 months after starting
- Then: at least annually

What to check

- Main symptom target: hot flashes, sleep, vaginal dryness, dyspareunia
- Side effects: breast tenderness, bloating, headache, nausea
- Bleeding pattern: especially unscheduled bleeding
- Blood pressure and general risk review
- Whether route still matches risk profile



Practical adjustment approach

- Hot flashes improved, side effects acceptable → continue same regimen
- Partial improvement after 3 months → check adherence and route, then consider dose or regimen change
- Unscheduled bleeding in first 3 months → can occur early, but monitor pattern carefully
- Persistent or concerning bleeding → investigate before continuing or escalating therapy
- VTE concern / oral intolerance → consider whether transdermal route is a better fit

Fast-access menopause follow-up table

Visit	Check	Action
Baseline	Symptom target, uterus status, contraindications	Choose systemic vs local, oral vs transdermal
3 months	Symptom response, side effects, bleeding	Continue, change dose, or change route
Any visit	Persistent bleeding or major adverse effects	Delay escalation and evaluate
Annual	Benefit-risk review	Continue only if still indicated and safe

C. Levothyroxine / Thyroid Follow-Up

When to review

- TSH every 3 months until stable
- Stable means 2 similar TSH measurements within range 3 months apart
- Then once yearly

What to check

- Symptoms: fatigue, cold intolerance, constipation, hair loss, dry skin
- Adherence and administration:
  - taken consistently?
  - taken away from food?
  - taken away from calcium / iron / coffee if relevant?
- Labs:
  - TSH
  - FT4 if symptoms persist or interpretation is unclear

Practical adjustment approach

- TSH above range + symptoms persist → consider increasing dose
- TSH in range + symptoms improved → continue same dose
- TSH in range + symptoms persist → consider FT4 and reassess non-thyroid causes before repeated dose escalation
- TSH suppressed / signs of overtreatment → reduce dose
- Recent dose change → avoid frequent overcorrection; NICE notes TSH can take up to 6 months to return to range when previously very high

Fast-access thyroid follow-up table

Visit	Check	Action
Baseline	TSH ± FT4, symptoms, medication timing	Start appropriate dose
Every 3 months until stable	TSH	Adjust gradually
If symptoms persist	TSH + consider FT4	Reassess diagnosis and adherence
Annual once stable	TSH	Maintain if controlled

D. Cortisol / Adrenal Follow-Up

This is not a routine “wellness follow-up” hormone. If true adrenal insufficiency is diagnosed, treatment and long-term follow-up should generally be managed with endocrine oversight.

Morning cortisol and ACTH are first-line when adrenal insufficiency is suspected, and the ACTH stimulation test is commonly used to confirm diagnosis. If glucocorticoid-induced adrenal insufficiency is possible, steroid tapering must be managed carefully rather than abruptly stopping therapy.

Practical rule

- Do not titrate cortisol-related therapy casually in aesthetic practice
- Suspected adrenal insufficiency, adrenal crisis risk, or steroid suppression → refer / co-manage

E. Melatonin Follow-Up

Melatonin is mainly a sleep-timing aid. In circadian disorders, the AASM notes that iming is more important than dose.

t If the patient improves, continue the lowest effective dose. If there is no benefit, do not keep increasing indefinitely; reassess sleep hygiene, schedule, light exposure, apnea risk, medications, and anxiety or mood contributors.

Practical rule

- Review after 2–4 weeks
- If no clear benefit:

1. check timing first
2. then stop or rethink the sleep plan

- Do not keep escalating above typical low-dose use without a clear reason

Universal “Why is this patient not improving?” checklist

Before raising any hormone dose, check:

- wrong diagnosis
- poor adherence
- wrong timing of administration
- absorption problem
- wrong route
- sleep problem
- obesity / metabolic disease
- depression / anxiety
- medication interaction
- unrealistic treatment goal

This step is especially important in thyroid and testosterone care because both symptoms and lab interpretation can be distorted by non-endocrine factors.



Documentation Template for Every Follow-Up

At each follow-up, document:

- main target symptom(s)
- symptom change: better / same / worse
- side effects
- adherence
- route and dosing consistency
- follow-up labs reviewed
- decision: continue / increase / decrease / hold / refer

Sample Follow-Up Note

Indication: _____
Current therapy: _____
Symptoms since last visit: improved / unchanged / worse
Side effects: none / mild / significant
Adherence: good / inconsistent / unclear
Labs reviewed:
Assessment: adequate response / under-response / overtreatment / unclear diagnosis
Plan: continue / adjust dose / change route / repeat labs / refer

Fast-Access Follow-Up Tables

1. Follow-up timing table

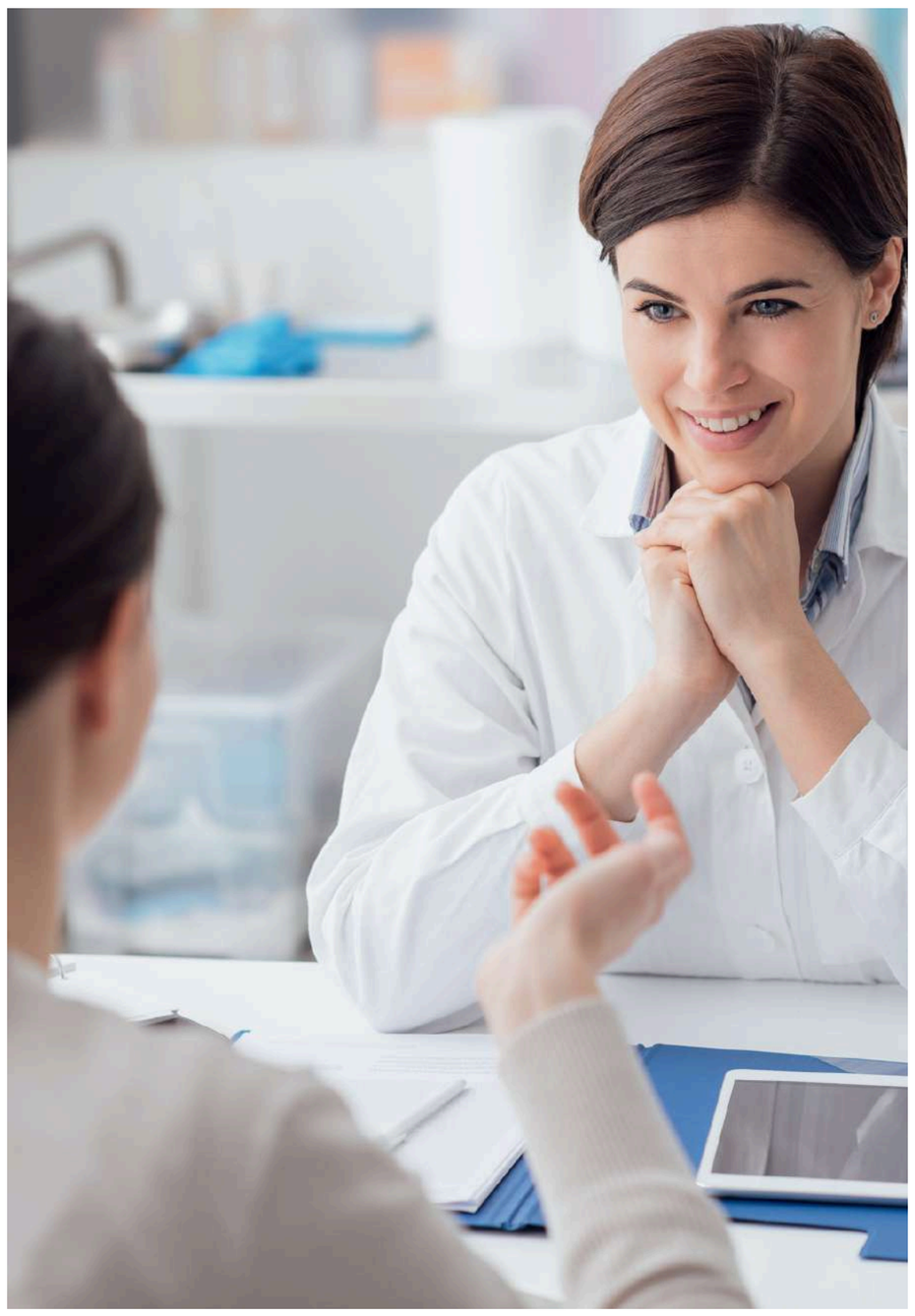
Therapy	First review	Ongoing review
Testosterone	3–6 months	Annually if stable
Menopausal hormone therapy	3 months	At least annually
Levothyroxine	Every 3 months until stable	Annually once stable
Melatonin	2–4 weeks	As needed based on response
Cortisol replacement	Specialist-led	Specialist-led

2. “Increase, hold, or reduce?” table

Situation	Action
Symptoms better, labs acceptable	Continue
Symptoms not better, labs still low / undertreated	Consider increase
Symptoms not better, labs already in target	Reassess diagnosis, do not reflexively increase
Clear side effects or safety issue	Reduce, hold, or change route
Abnormal bleeding on HRT or hematocrit >54% on testosterone	Pause and evaluate

Practical prescribing principle

This chapter can help structure treatment, but safe prescribing still depends on your licensure, local regulation, product-specific labeling, and patient-specific judgment. The most practical rule is: treat the patient, confirm with the labs, and never escalate because of impatience alone. The official guidelines consistently support structured review, measured titration, and repeat reassessment rather than rapid dose chasing.





Part V. Supportive and Integrative Care

Hormone therapy works best when it is not used in isolation. Sleep, nutrition, physical activity, stress load, and realistic aesthetic planning all affect how patients feel and how well they respond to treatment. In menopause care, for example, major organizations discuss both hormone therapy and nonhormonal strategies such as lifestyle changes, symptom tracking, and supportive care. Complementary approaches may help some patients, but dietary supplements have not been clearly shown to relieve menopause symptoms consistently, and long-term safety is often uncertain.

This part of the book places hormone therapy into a broader clinical framework. The goal is not to replace evidence-based hormone treatment with “wellness” language, and it is not to exaggerate supplements or lifestyle measures as cures. Instead, the goal is to show how supportive care improves patient selection, treatment tolerance, symptom control, and long-term outcomes, while also helping clinicians avoid overpromising what hormones alone can accomplish.

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LIFESTYLE, SUPPLEMENTS, AND AESTHETIC INTEGRATION

Hormone therapy should be integrated into a wider treatment plan rather than presented as a complete solution. Patients with poor sleep, high stress, sedentary habits, erratic eating patterns, or unrealistic cosmetic expectations are less likely to feel satisfied even when the hormonal diagnosis is correct. In practical care, supportive treatment is not secondary. It is part of the foundation.

Nutritional Support and Lifestyle Modifications

Nutrition and lifestyle matter because many complaints often attributed to hormones, such as fatigue, poor recovery, low mood, and weight gain, are strongly influenced by daily habits. Menopause-focused guidance from NCCIH notes that physical and psychological approaches such as yoga and other exercise-based methods may help relieve some menopausal symptoms, while ACOG also emphasizes lifestyle changes as part of symptom management.

In clinical practice, nutritional support does not mean prescribing vague “anti-aging diets.” It means identifying problems that interfere with recovery and symptom control, such as irregular meals, excessive caffeine late in the day, alcohol that worsens sleep, or habits that promote weight gain and metabolic instability.



For many patients, the most useful nutrition advice is the simplest: regular meals, adequate protein, hydration, and fewer behaviors that worsen sleep and hot flashes. NIA guidance on menopause and sleep specifically advises avoiding large meals close to bedtime, limiting caffeine late in the day, and recognizing that alcohol can worsen sleep quality.

Sleep, Exercise, and Stress Regulation

Sleep is one of the most important supportive targets because poor sleep makes almost every hormone-related complaint feel worse. NIA notes that menopause-related hot flashes can disrupt sleep, and practical sleep-support advice includes regular exercise earlier in the day, avoiding large meals close to bedtime, limiting caffeine later in the day, and keeping the bedroom comfortable and quiet.

Exercise and movement also matter, not because they "balance hormones" in a simplistic way, but because they improve body composition, energy, mood, and sleep quality. NCCIH reports that yoga appears at least as effective as other types of exercise for relieving some menopause symptoms, and broader NCCIH summaries suggest that yoga, tai chi, and meditation-based programs may help reduce hot flashes, stress, sleep disturbance, and mood symptoms in some patients.

Stress regulation should be framed realistically. Not every stressed patient has a cortisol disorder, but chronic stress can worsen sleep, coping, symptom tolerance, and patient satisfaction. Relaxation techniques and mind-body approaches may support overall health, and NCCIH notes that relaxation and stress-management practices can be useful parts of a healthy lifestyle.

Supplements for Hormone Balance and Longevity

Supplements are one of the most overused and oversold parts of anti-aging care. NCCIH states that phytoestrogens, herbs, and other dietary supplements have not been clearly shown to relieve menopause symptoms, and it also notes that dietary supplements may have side effects, may interact with drugs, and often lack strong long-term safety data.

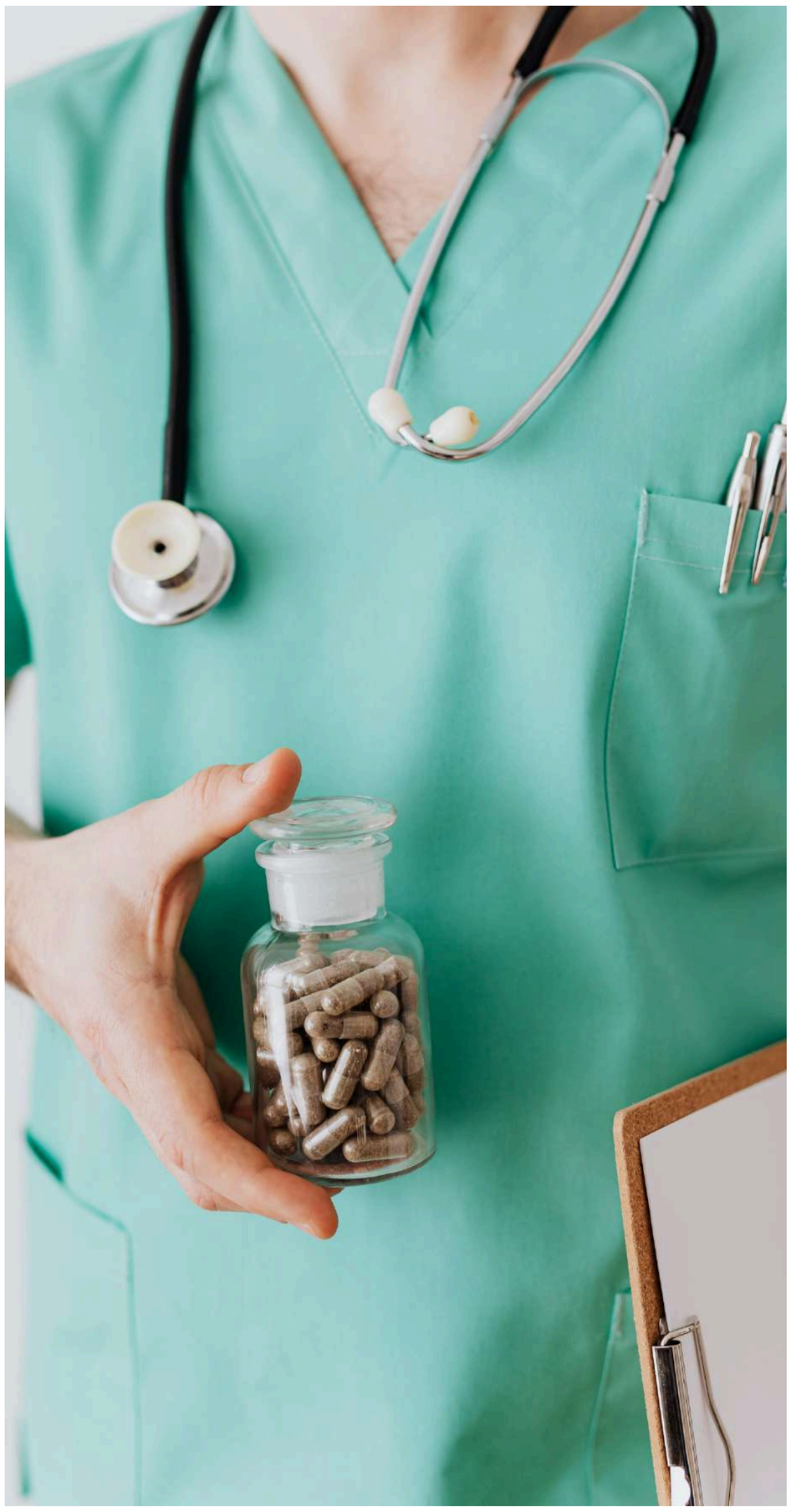
That does not mean every supplement is useless. It means supplements should be treated as supportive tools, not as proven hormone replacement or guaranteed longevity interventions. Clinicians should be especially careful with products marketed for "hormone balance," "adrenal support," or "bioidentical

optimization," because the evidence is often weak compared with established therapies and standard medical care. NCCIH also notes that custom-mixed compounded bioidentical hormones have not been shown to be more effective or safer than conventional hormone therapy.

A practical approach is to use supplements selectively, review the patient's full medication and supplement list, and avoid presenting over-the-counter products as equivalent to evidence-based hormone treatment. When a patient is already taking multiple supplements, the clinician should simplify rather than add more without a clear reason.

Avoiding Exaggerated Anti-Aging Claims

This is one of the most important chapters for protecting both patients and clinicians. Anti-aging medicine often overstates what hormones, supplements, and restorative protocols can achieve. Claims such as "reverse aging," "restore youthful hormones," or "balance everything naturally" are not clinically responsible when the evidence is limited, mixed, or condition-specific. NCCIH explicitly notes that evidence does not support claims that compounded bioidentical hormones are more effective than conventional therapy, and many supplements promoted for menopause or longevity lack clear proof of benefit.



The safest communication style is precise and modest. Hormone therapy may improve specific symptoms in selected patients. Lifestyle care may improve sleep, stress tolerance, and treatment response. Supplements may have a limited role in selected cases. None of these should be sold as universal rejuvenation strategies.

Combining Hormone Therapy With Aesthetic Procedures

Hormone therapy and aesthetic procedures often complement one another, but they do not replace each other. A patient with untreated menopausal symptoms may have worse sleep, lower tolerance, and less satisfaction even if injectables or skin treatments are technically well performed. A patient with vaginal dryness, night sweats, and poor sleep may benefit from hormone treatment or nonhormonal menopause care while also receiving aesthetic care for structural or skin concerns. ACOG and NIA both emphasize that menopause symptoms such as hot flashes, sleep problems, and vaginal dryness can significantly affect daily well-being.

The practical rule is to align the intervention with the problem. Hormone therapy is for hormonal symptoms and selected endocrine indications. Procedures are for wrinkles, laxity, pigmentation, volume loss, and other local aesthetic goals. Supportive care helps both. When these roles are explained clearly, the treatment plan becomes more realistic and more effective.

Setting Safe and Realistic Expectations

Patients should understand that supportive care improves outcomes gradually and indirectly. Better sleep may improve fatigue and resilience. Exercise may improve body composition and mood. Hormone therapy may improve vasomotor or sexual symptoms. Aesthetic procedures may improve visible aging features. But no single intervention will solve every complaint. This is especially important in patients who present with multiple overlapping concerns and expect one treatment to restore everything at once.

A good expectation-setting conversation includes three points: what this treatment is for, what it is not for, and what other parts of the plan matter just as much. That approach reduces overtreatment, prevents disappointment, and helps patients see supportive care not as an optional extra, but as part of serious clinical practice.

Quick Practical Integration Box

Use lifestyle and supportive care in almost every patient

- improve sleep habits
- review caffeine, alcohol, meal timing, and exercise timing
- address stress and recovery habits
- simplify unnecessary supplements
- separate hormonal symptoms from cosmetic goals

Use supplements cautiously

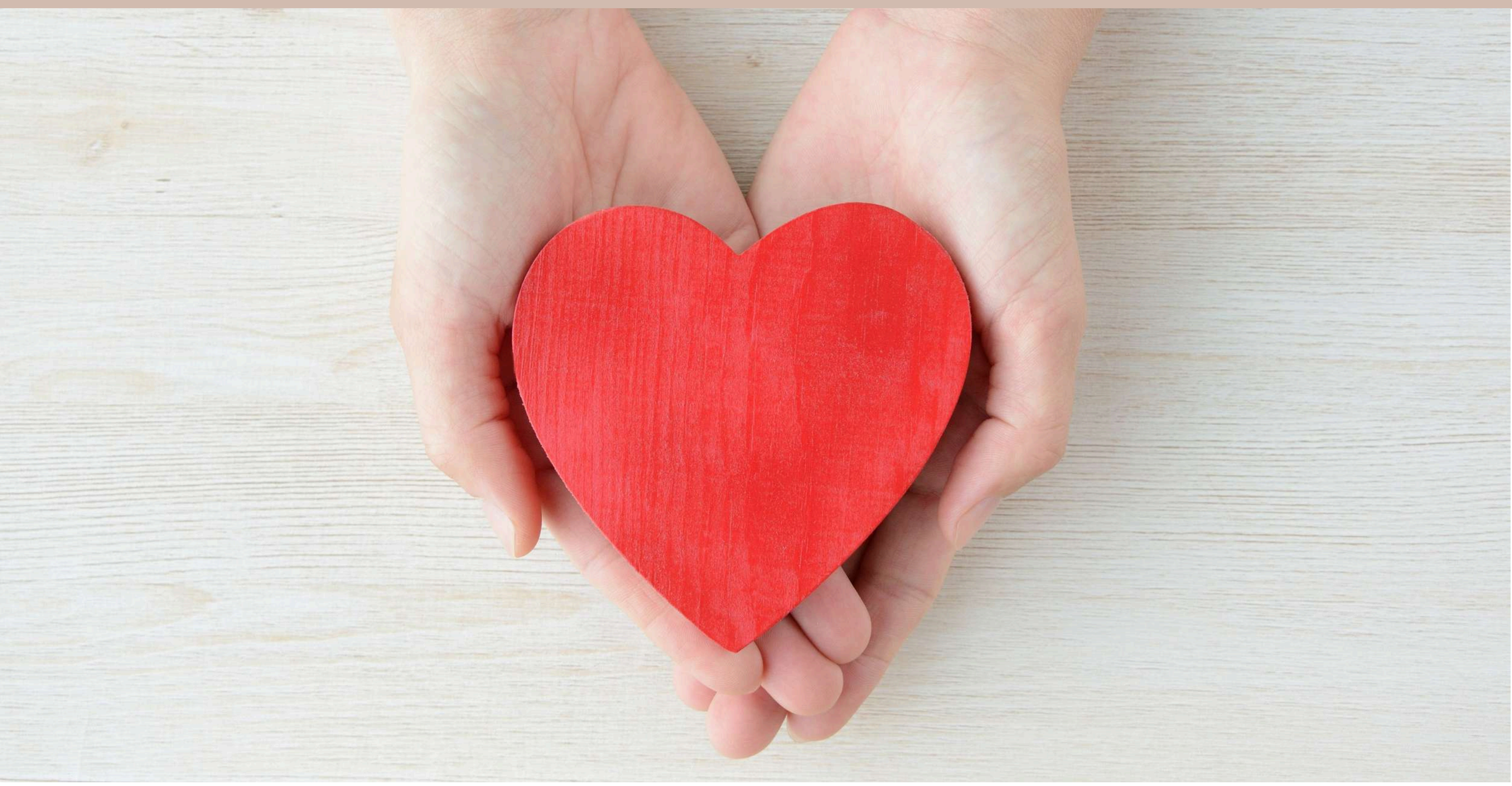
- do not present supplements as replacements for proven hormone therapies
- review interactions and long-term safety concerns
- avoid exaggerated longevity claims

Combine care thoughtfully

- hormones for appropriate endocrine indications
- local or procedural treatment for visible aesthetic issues
- supportive care for sleep, resilience, and adherence

Quick Clinical Takeaway

Supportive and integrative care should make hormone therapy safer, more realistic, and more effective. The best results usually come when sleep, stress, exercise, nutrition, and careful expectation setting are treated as part of the clinical plan rather than as optional advice. Supplements may have a limited role, but they should be used cautiously and never marketed as a shortcut to hormone balance or longevity.



Part VI. Safety and Applied Practice

The final section of this book focuses on how to use hormone therapy safely in real patients. By this stage, the clinician already understands the major hormones, testing principles, and basic treatment design. What remains is the part that often determines whether treatment stays responsible over time: recognizing side effects early, knowing when to pause or stop, communicating clearly with patients, and applying the material to common clinical presentations. Across major hormone therapies, guidelines consistently emphasize structured follow-up, reassessment, and ongoing risk review rather than open-ended escalation.

This section is intentionally practical. The first chapter focuses on adverse effects, consent, and ethical prescribing, because these are the safeguards that protect both patient and clinician. The second chapter applies the book's approach to common scenarios such as low libido, perimenopausal symptoms, thyroid-related aesthetic complaints, and mixed anti-aging consultations. The goal is not to turn these examples into rigid formulas, but to show how a structured, evidence-based process can be used in day-to-day practice.

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ADVERSE EFFECTS, ETHICS, AND PATIENT COMMUNICATION

Hormone therapy should never be judged only by whether the patient feels better. It must also be judged by whether the treatment remains safe, proportionate, and clinically justified. Many patients initially focus on desired benefits such as better sleep, improved libido, less fatigue, or relief of menopausal symptoms. The clinician's role is to track both benefit and harm with the same level of attention. That means asking about side effects at every review, repeating the right labs, and being willing to reduce, pause, or stop treatment when the risk-benefit balance changes.

Common side effects by hormone class

Testosterone therapy can cause acne, fluid retention, mood change, and rising hematocrit. The Endocrine Society specifically recommends monitoring hematocrit and stopping therapy if it rises above 54% until it returns to a safe level.

Menopausal hormone therapy may cause vaginal spotting or bleeding, temporary breast soreness, and bloating. ACOG notes these as common side effects and also emphasizes that risk depends on the patient's history, the formulation, and the route used.



Levothyroxine overtreatment may lead to symptoms of excess thyroid hormone rather than benefit. NICE recommends adjusting dose to restore well-being while keeping TSH in range and avoiding over-treatment.

Melatonin is usually better tolerated than the major replacement hormones, but side effects can still occur. NCCIH lists headache, dizziness, nausea, and sleepiness among the mild side effects reported in studies.

Early warning signs of inappropriate dosing

The earliest sign of inappropriate dosing is often a mismatch between symptoms and objective follow-up. If testosterone is already in range and the patient still feels unwell, the solution is not automatic escalation. If TSH is already normalized and the patient still feels tired, repeatedly increasing levothyroxine may create over-treatment rather than improvement. If menopausal hormone therapy is causing persistent bleeding or side effects without meaningful symptom benefit, the regimen may need to change rather than intensify.

Practical warning signs include rising hematocrit on testosterone, persistent unscheduled bleeding on menopausal hormone therapy, suppressed TSH or hyperthyroid symptoms on levothyroxine, and daytime sedation or dizziness on melatonin. These are not small details. They are the signals that tell the clinician whether the current plan is still safe.

Managing intolerance and poor response

When a patient is not doing well, the first step is not to blame the hormone or assume treatment failure. The first step is to check adherence, timing, route, interactions, and whether the original diagnosis is still the most likely explanation. This is especially important in thyroid and testosterone treatment, where symptoms are nonspecific and many non-endocrine conditions can mimic under-treatment.

If intolerance is mild, changing the route or lowering the dose may be enough. If there is no benefit despite appropriate levels, the clinician should reconsider the diagnosis and the treatment goal rather than intensifying treatment indefinitely. Structured reassessment is more important than fast escalation.

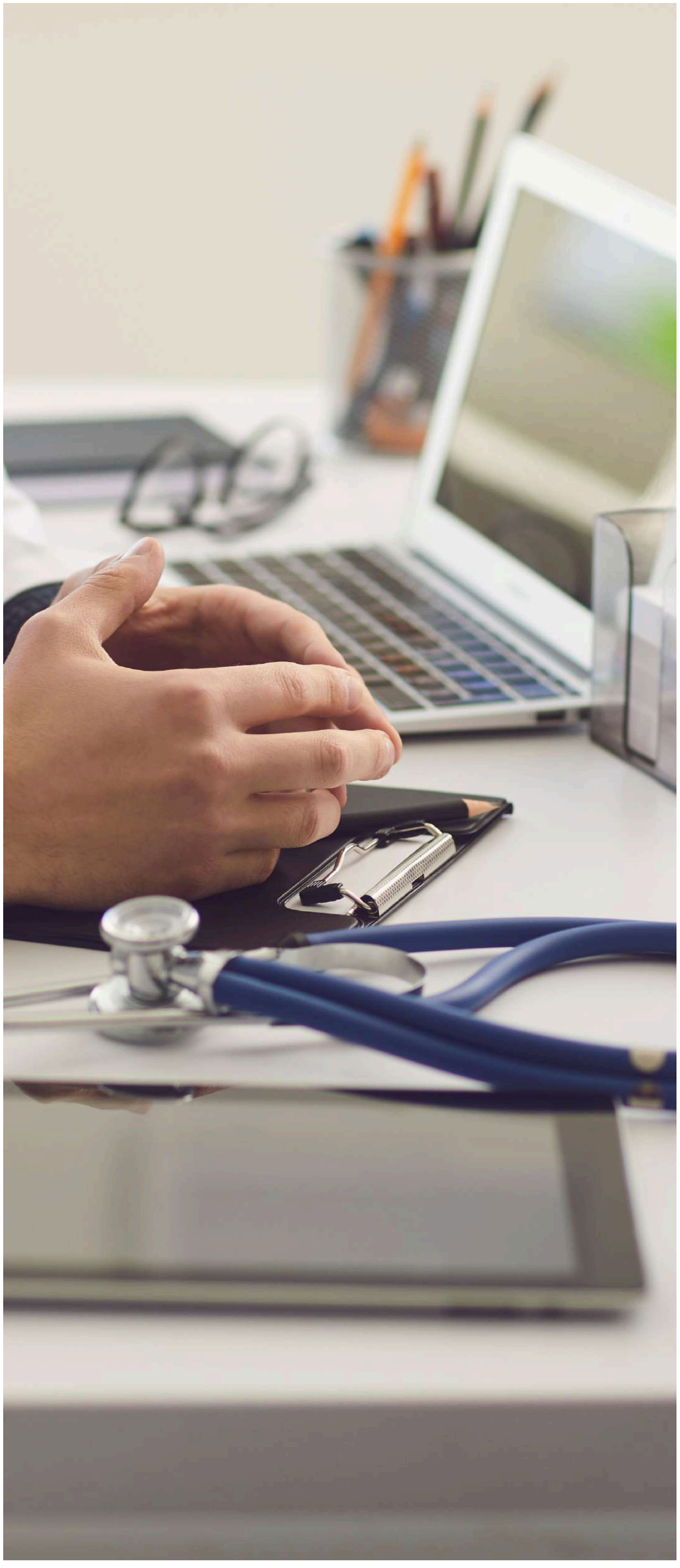
When to pause, modify, or discontinue therapy

Hormone therapy should be paused or modified when risk clearly outweighs benefit. Testosterone should be held if hematocrit exceeds 54%, and the patient should be reassessed for contributing factors such as hypoxia or sleep apnea before restarting at a reduced dose.

Menopausal hormone therapy should be reconsidered if bleeding is persistent or concerning, if side effects become unacceptable, or if a new contraindication appears. ACOG also highlights major reasons systemic therapy is usually not recommended, including prior clotting events, liver disease, or certain cancer histories.

Levothyroxine should be reduced if there is biochemical or clinical evidence of over-replacement. NICE monitoring guidance supports gradual adjustment and warns against over-treatment.

Melatonin should be reduced or stopped if it causes persistent daytime sleepiness, dizziness, or other troublesome adverse effects, especially when used longer than intended.



Informed consent

Informed consent in hormone therapy should be practical and specific. The patient should understand why the treatment is being offered, what symptoms it is expected to help, what it is unlikely to fix, what common side effects may happen, what monitoring is required, and what situations would require treatment to be changed or stopped. In menopause care, ACOG emphasizes shared decision-making and individualized review of benefits and risks.

Good consent also means discussing uncertainty honestly. Some treatments, such as DHEA, pregnenolone, or melatonin used broadly for "anti-aging," have weaker evidence than established replacement therapies. Patients should know when evidence is strong and when it is limited.

Ethical integration into aesthetic practice

Ethical hormone care in aesthetic medicine means using hormones for defined clinical reasons, not as a shortcut to meet cosmetic expectations.

It also means avoiding exaggerated claims such as "reversing aging" or "optimizing everything," especially when the evidence does not support those promises. Patients often come to aesthetic clinics with overlapping functional and cosmetic goals, and that makes clear boundaries even more important.

The most ethical approach is simple: identify the real indication, explain the likely benefit in plain language, monitor actively, and stop or refer when the case exceeds the clinician's safe scope.

Quick practice

At each follow-up, ask:

- Is the patient actually improving?
- Are there side effects?
- Are the follow-up labs acceptable?
- Is the treatment still justified?
- Is there any reason to pause, lower, or stop?

Pause or modify if:

- hematocrit rises above 54% on testosterone
- persistent unscheduled bleeding develops on menopausal hormone therapy
- TSH becomes suppressed or hyperthyroid symptoms appear on levothyroxine
- melatonin causes persistent daytime impairment

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CASE-BASED CLINICAL APPLICATIONS

Case-based review helps translate principles into real clinical reasoning. The purpose of these cases is not to create rigid protocols, but to show how assessment, safety screening, treatment selection, and follow-up work together in common presentations.

1. Fatigue and low libido presentation

A middle-aged man presents with low libido, reduced morning erections, and low energy. The first step is not immediate testosterone. The correct approach is a focused history, early-morning total testosterone, repeat confirmation if low, and review of sleep, weight, mood, medications, and fertility plans. If symptoms and repeat low testosterone are both present, testosterone therapy may be appropriate if there are no major contraindications.

At follow-up, benefit should be judged mainly by sexual symptoms, energy, and overall function, while monitoring hematocrit and testosterone levels at the recommended interval. If symptoms do not improve despite acceptable levels, the diagnosis should be re-examined before the dose is increased.



2. Perimenopausal symptom presentation

A woman in her late forties presents with irregular cycles, hot flashes, night sweats, and poor sleep. In many cases, the diagnosis is mainly clinical, based on age, symptom pattern, and menstrual history. Extensive hormone testing is often not necessary unless the picture is atypical. If symptoms are bothersome and contraindications are absent, menopausal hormone therapy may be considered, with route and uterine status guiding the regimen.

The practical follow-up point is to review at around 3 months, assess whether vasomotor symptoms improved, and ask specifically about bleeding, breast tenderness, and tolerability.

3. Menopausal skin, sleep, and mood concerns

A patient may present mainly with “aging skin,” but further discussion reveals poor sleep, hot flashes, irritability, and vaginal dryness. This is a reminder that aesthetic complaints may sit on top of menopausal symptoms. The treatment plan may therefore need two components: symptom-focused menopause care and a separate aesthetic plan for structural or skin concerns. Hormone therapy may help the functional symptoms, but it does not replace good skincare, injectables, or device-based treatment when those are also indicated.

This kind of case is where communication matters most. The patient should know which symptoms hormone therapy may help and which concerns require separate aesthetic treatment.

4. Thyroid-related aesthetic complaints

A patient presents with hair shedding, dry skin, fatigue, mild weight gain, and feeling “older than before.” This is a classic situation where thyroid disease should be considered. The practical workup is TSH with free T4, and treatment decisions should follow the lab pattern rather than symptoms alone. If hypothyroidism is confirmed, levothyroxine is standard treatment, with TSH-based adjustment over time.

This case shows why thyroid assessment matters in aesthetic medicine. A patient may continue to feel dissatisfied with appearance-focused treatments if the underlying endocrine issue is untreated.

5. Multi-symptom anti-aging consultation

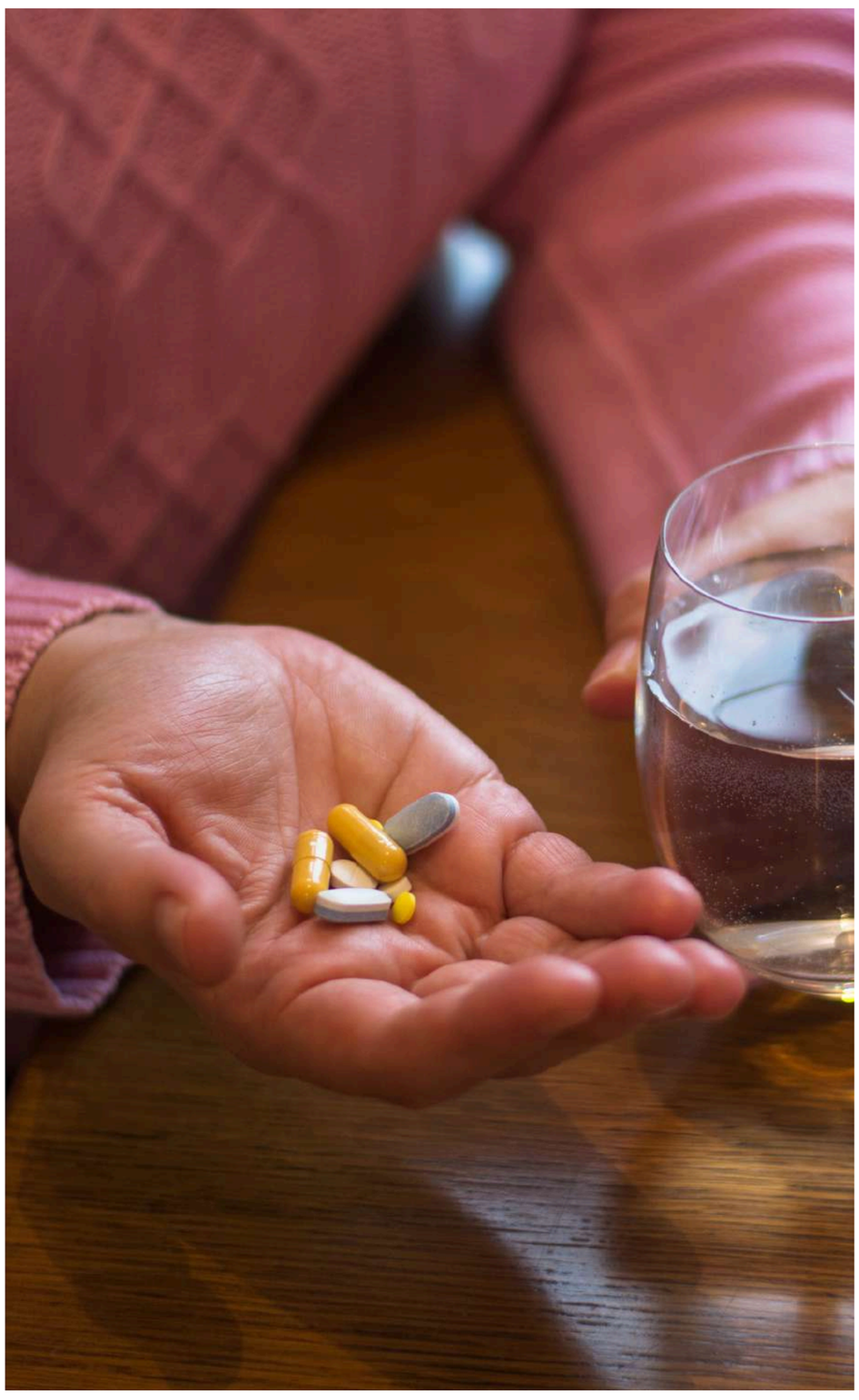
Some patients arrive with fatigue, poor sleep, body-composition frustration, reduced libido, hair concerns, and a general wish to “optimize hormones.” This is exactly the kind of consultation where over-treatment becomes tempting. The safer approach is to separate the complaint into domains: sleep, menopause or sexual symptoms, thyroid-type symptoms, lifestyle factors, and clear endocrine indications. Then order only the tests that answer the real clinical questions.

In these cases, it is common to find that only part of the presentation is hormonal, while the rest relates to sleep, stress, exercise, diet, medications, or unrealistic expectations. The consultation becomes much more effective when those layers are separated clearly.

6. Treatment adjustment follow-up case

A patient returns saying, “I’m a little better, but not enough.” This is the most important follow-up moment. The clinician should resist reflex dose escalation and instead review adherence, timing, route, interval since starting, side effects, and the right follow-up labs. For testosterone, that means checking whether the level is already in the target range and whether hematocrit is safe. For levothyroxine, that means checking TSH and how the patient takes the medication. For menopausal hormone therapy, that means checking symptom pattern, bleeding, and route suitability.

This is where safe practice differs from casual prescribing. A good follow-up plan is structured, patient-specific, and willing to stop escalating when the biology does not support it.



Quick case-use box

Use this approach in every case:

1. define the main complaint
2. identify the most likely hormonal question
3. screen for contraindications and red flags
4. order only the most useful tests
5. match the treatment to the symptom target
6. reassess with both symptoms and objective follow-up
7. change course if the treatment is not helping or is becoming unsafe

If you want, the next step can be turning all chapter titles and body text into a polished manuscript format with consistent headings and spacing.

Appendices

Appendix A. Baseline History Checklist

Use this at the first consultation before ordering treatment-related labs or discussing prescriptions.

Presenting concerns

- Main symptoms
- Onset and duration
- Most bothersome complaint
- Severity and impact on daily life

Hormone-related symptom review

- Fatigue / low vitality
- Hot flashes / night sweats
- Low libido / sexual dysfunction
- Sleep disturbance
- Mood change / irritability / low mood
- Weight change / body-composition change
- Hair thinning / hair shedding
- Dry skin / skin change
- Vaginal dryness / dyspareunia
- Reduced morning erections in men

Medical history

- Thyroid disease
- Diabetes / insulin resistance
- Hypertension / cardiovascular disease
- Liver disease
- Sleep apnea

- Depression / anxiety
- Cancer history
- Blood clot history
- Pituitary / adrenal disease
- Prior hormone therapy

Medication and supplement review

- Current prescriptions
- Steroid exposure
- Thyroid medication
- Contraception / HRT
- Testosterone use
- Sleep supplements
- “Hormone balance” supplements
-

Reproductive history

- Menstrual status
- Cycle change
- Last menstrual period
- Pregnancy / fertility plans
- Menopausal symptoms
- Hysterectomy / uterine status
- Male fertility plans before testosterone

Safety screen

- Unexplained vaginal bleeding

Appendices

- Breast / endometrial / prostate cancer history
- Stroke / MI history
- Thrombotic history
- Liver disease
- Severe LUTS
- Untreated severe sleep apnea
- Pregnancy / breastfeeding

Initial decision

- Likely hormonal?
- Likely mixed / non-hormonal?
- Need labs?
- Need delay?
- Need referral?

Appendices

Appendix B. Suggested Laboratory Evaluation Panels

Order labs by suspected imbalance, not as one unfocused panel.

1. **General baseline**

- CBC
- CMP
- Lipid profile
- HbA1c
- TSH
- Free T4

2. **Suspected testosterone deficiency**

- Total testosterone, early morning
- Repeat total testosterone, early morning if low
- Free testosterone if needed
- LH
- FSH
- Prolactin
- CBC
- CMP
- PSA when clinically appropriate

The Endocrine Society recommends diagnosing hypogonadism only in men with symptoms plus unequivocally and consistently low testosterone, confirmed with repeat morning testing.

3. **Suspected menopausal / estrogen-progesterone pattern**

- CBC

- CMP
- TSH
- Free T4
- Consider FSH
- Consider estradiol

NICE notes menopause is usually diagnosed from symptoms in people aged 45 and over rather than by routine hormone testing.

4. Suspected thyroid imbalance

- TSH
- Free T4
- T4 if useful locally
- T3 / Free T3 when hyperthyroidism is part of the differential
- CBC
- CMP

NICE recommends TSH monitoring for levothyroxine-treated primary hypothyroidism every 3 months until stable, then yearly; FT4 can be added if symptoms persist.

5. Suspected cortisol / adrenal disorder

- Morning serum cortisol
- ACTH
- CBC
- CMP
- Electrolytes

6. Suspected GH / IGF-1 issue

- IGF-1
- Refer if abnormal or clinically suspicious

7. Suspected DHEA-related question

- DHEA-S selectively

Appendices

Appendix C. Monitoring Timeline Templates

Testosterone
• Baseline: testosterone, CBC/hematocrit, safety review • 3–6 months: testosterone, hematocrit, symptom review • Then: annually if stable
• The Endocrine Society recommends checking testosterone at 3–6 months and hematocrit at baseline, 3–6 months, then annually.

Menopausal hormone therapy
• Baseline: symptom target, uterus status, contraindications • 3 months: response, side effects, bleeding, route suitability • Then: at least annually
• NICE quality standards recommend review 3 months after starting menopause treatment and then at least annually.

Levothyroxine
• Baseline: TSH ± FT4, symptom review • Every 3 months until stable • Then: yearly
• NICE recommends TSH every 3 months until stable, then once a year.

Appendices

Melatonin
• Review at 2–4 weeks • Continue only if clearly helping • Reassess timing and sleep hygiene before increasing

Cortisol / adrenal therapy
• Specialist-led follow-up

Appendices

Appendix D. Evidence-Based Dosing Tables for Common Hormone Therapies

Use these as quick-reference starting frameworks, not substitutes for product labeling, local rules, or patient-specific judgment.

1. Testosterone		
Therapy	**Practical dosing note**	**Monitoring**
Testosterone replacement in confirmed male hypogonadism	Use an approved replacement regimen for the chosen formulation; titrate to symptom response and mid-normal serum testosterone	Testosterone at 3–6 months; hematocrit baseline, 3–6 months, then yearly
The Endocrine Society recommends aiming for the mid-normal range and monitoring hematocrit regularly.		

2. Menopausal hormone therapy	
Situation	**Practical regimen note**
Vasomotor symptoms	Use systemic estrogen when appropriate
Uterus intact	Add progestogen / progestin for endometrial protection
Vaginal dryness / dyspareunia	Use local vaginal estrogen when appropriate
Higher VTE concern	Prefer transdermal estrogen over oral when suitable
ACOG notes oral estrogen is associated with more prothrombotic effect than transdermal estrogen.	

Appendices

3. Levothyroxine		
Therapy	**Practical dosing note**	**Monitoring**
Primary hypothyroidism	Start an appropriate replacement dose based on age and risk profile; titrate gradually	TSH every 3 months until stable, then yearly
NICE recommends gradual titration with TSH-based monitoring.		

4. Hydrocortisone for confirmed adrenal insufficiency	
Therapy	**Dose**
Hydrocortisone	15–25 mg/day orally in 2–3 divided doses
This is consistent with Endocrine Society primary adrenal insufficiency guidance.	

5. Melatonin	
Situation	**Typical practical use**
Sleep-onset / circadian support	0.5–3 mg before bedtime; keep dose low and review response

6. DHEA	
Situation	**Practical note**
Selected use only	Some studies used 25–50 mg/day, but evidence is limited and inconsistent
DHEA is not established as routine anti-aging therapy.	

Appendices

Appendix E. Contraindications and Caution Checklists

Menopausal hormone therapy

Do not routinely start systemic therapy if the patient has:

- breast cancer history
- endometrial cancer history
- stroke history
- heart attack history
- blood clot history
- liver disease
- unexplained vaginal bleeding

ACOG lists these as major reasons systemic therapy is usually not recommended.

Testosterone therapy

Avoid or delay in:

- fertility plans
- prostate or breast cancer
- elevated hematocrit
- untreated severe sleep apnea
- severe LUTS
- uncontrolled heart failure
- recent MI or stroke
- thrombophilia

These are highlighted in Endocrine Society guidance.

Thyroid treatment

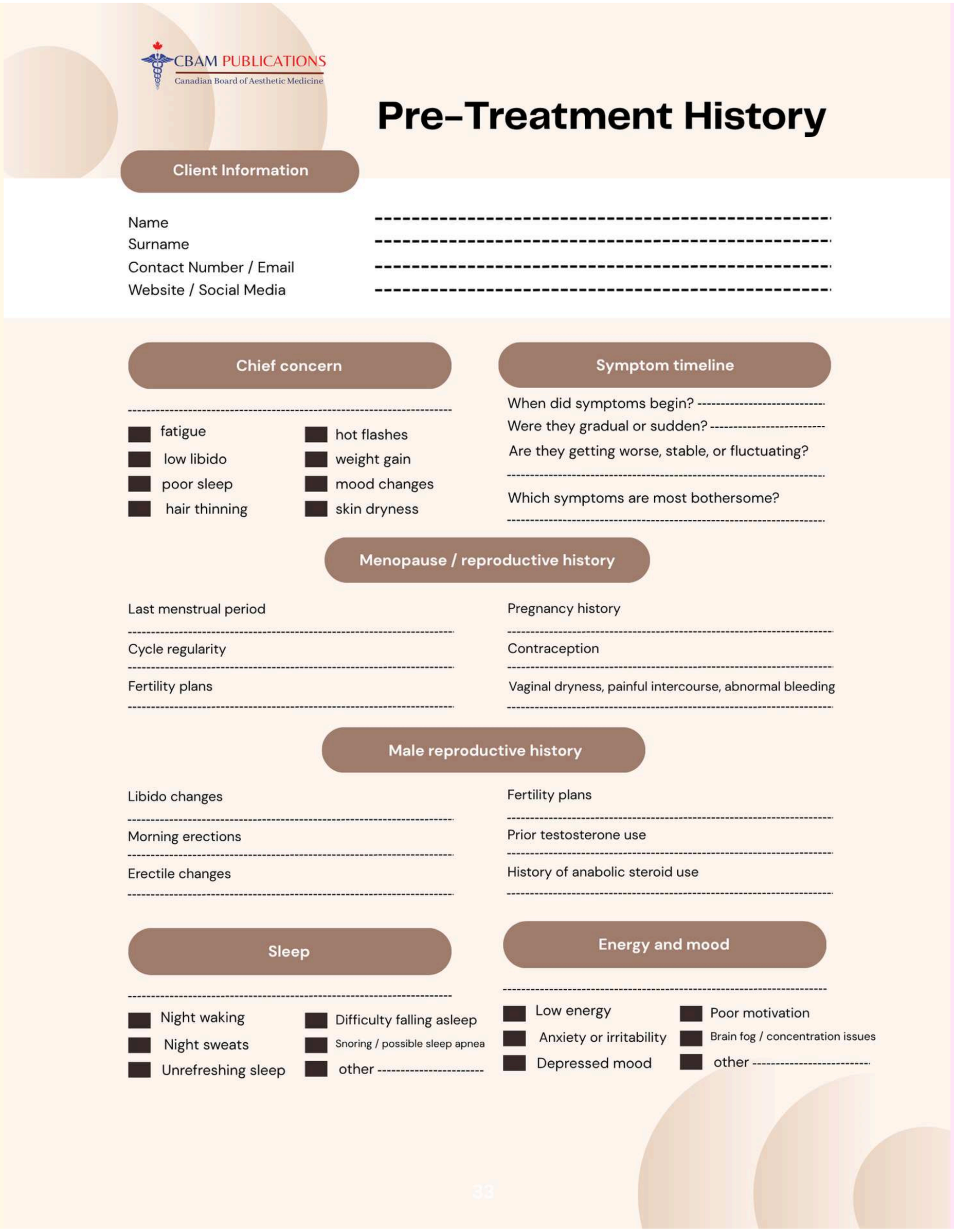
Use caution in:

- unclear diagnosis
- suppressed TSH from overtreatment
- persistent symptoms with normal TSH
- suspected central hypothyroidism
- major cardiac disease requiring careful titration

NICE and thyroid guidance support cautious reassessment rather than aggressive escalation.

Appendices

Appendix F. Sample pretreatment Template



Appendices

CBAM PUBLICATIONS
Canadian Board of Aesthetic Medicine

Hair, skin, body composition

- ☐ Dry skin
- ☐ Hair thinning or shedding
- ☐ Weight change
- ☐ Increased abdominal fat
- ☐ Muscle loss
- ☐ other ----------

Past medical history

- ☐ Thyroid disease
- ☐ Diabetes / insulin resistance
- ☐ Liver disease
- ☐ Hypertension / cardiovascular disease
- ☐ Cancer history
- ☐ Sleep apnea
- ☐ Depression / anxiety
- ☐ Blood clots
- ☐ other ----------

Medication and supplement review

Prescription medications ----------
Hormone use ----------
Thyroid medication ----------
Contraceptives ----------

Antidepressants ----------
Steroids ----------
Supplements / herbs / "hormone boosters"

Red flags / safety review

Unexplained bleeding

Breast or endometrial cancer history

Prostate issues

Liver disease

Recent heart attack or stroke

History of thrombosis

Pregnancy

Initial impression

Likely hormonal pattern?

Possible non-hormonal contributors?

Need for labs?

Need to delay treatment?

Need for referral?

Appendices

Appendix G. Fast-Access Treatment Algorithms

1. Low libido / low vitality in a man

- Symptoms suggestive? → order early-morning testosterone
- If low → repeat early-morning testosterone
- If repeat low + symptoms + safe → consider testosterone therapy
- If testosterone normal → reassess sleep, mood, obesity, meds, relationship factors

This follows Endocrine Society diagnostic standards.

2. Hot flashes / night sweats / cycle change

- Typical perimenopausal or menopausal presentation? → diagnose mainly clinically if age and history fit
- If symptoms significant and no contraindications → consider menopausal hormone therapy
- If mainly vaginal dryness / dyspareunia → consider local therapy first

NICE and ACOG support this symptom-based approach.

3. Fatigue + dry skin + hair loss + weight change

→ order TSH + FT4

- If hypothyroid pattern → start levothyroxine appropriately
- → recheck TSH every 3 months until stable

NICE supports this monitoring structure.

4. Severe fatigue + dizziness + steroid history
→ think adrenal insufficiency → order morning cortisol + ACTH → refer / co-manage if suspicious

5. “Not better yet” follow-up
Before increasing any dose, check: • diagnosis • adherence • timing / absorption • route suitability • side effects • lab target • non-hormonal contributors

References

Clinical Guidelines

- **Endocrine Society.** Testosterone Therapy in Men With Hypogonadism: An Endocrine Society Clinical Practice Guideline.
- **NICE**. **Menopause**: identification and management.
- **NICE**. **Thyroid disease**: assessment and management.
- **ACOG**. **Hormone Therapy** for Menopause.
- **ACOG**. **Postmenopausal** Estrogen Therapy Route of Administration and Risk of Venous Thromboembolism.

Consensus Statements

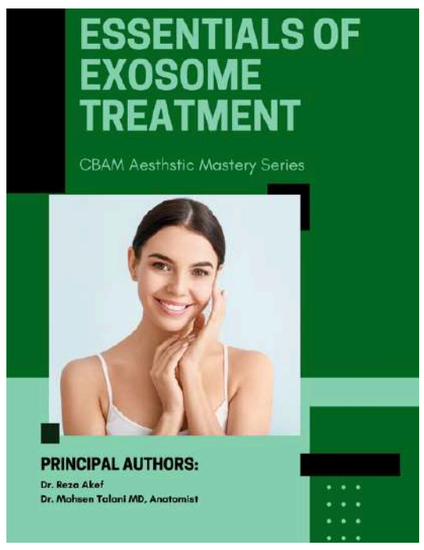
- **ACOG**. Compounded Bioidentical Menopausal Hormone Therapy.
- **ACOG**. Hormone Therapy in Primary Ovarian Insufficiency.

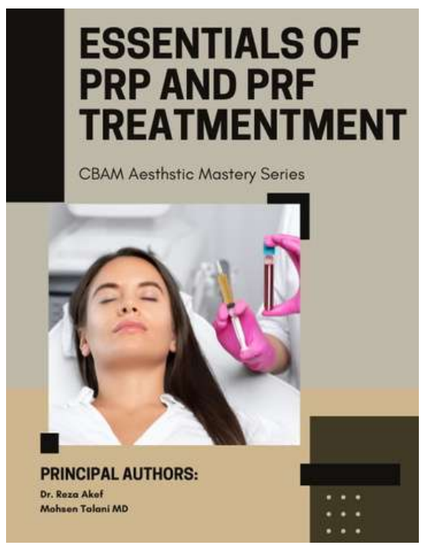
Key Reviews and Primary Studies

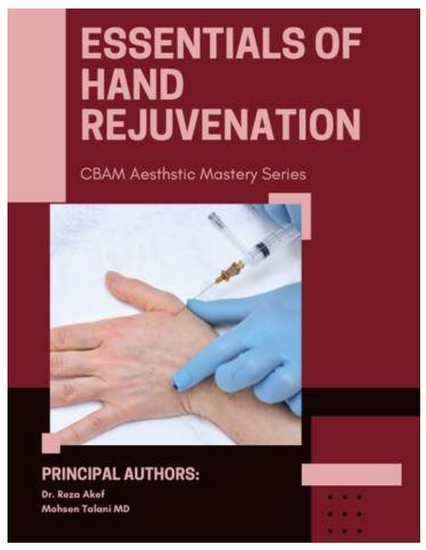
- **NICE** menopause quality standard on 3-month and annual review.
- **BNF** / NICE hypothyroidism monitoring summary.

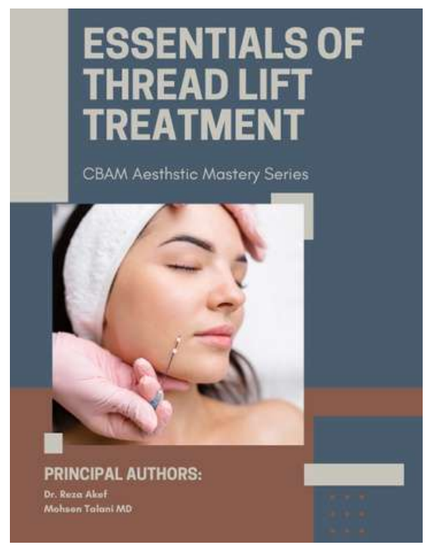
If you want, the next step should be turning everything into one clean, book-style manuscript version with consistent formatting and no repeated headings.

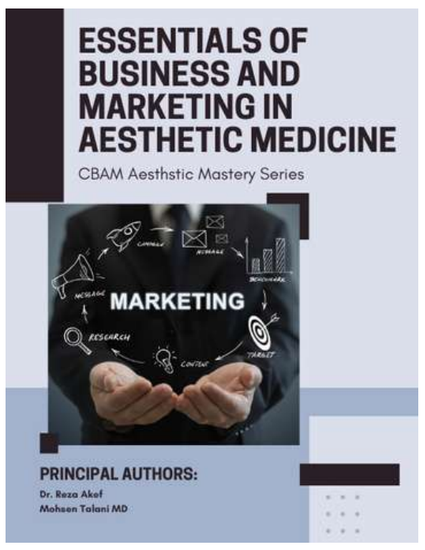
CBAM Aesthstic Mastery Series

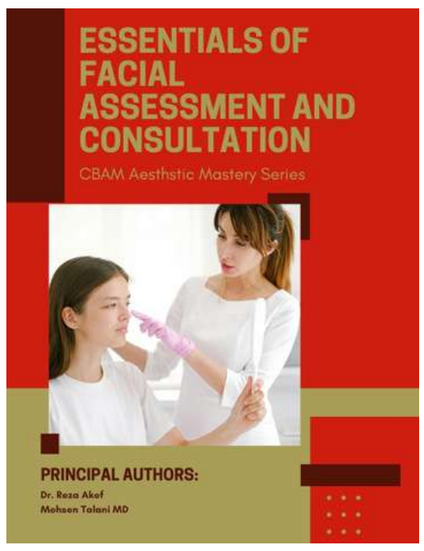


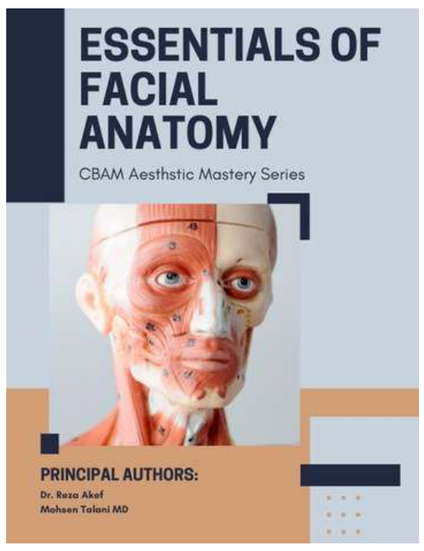




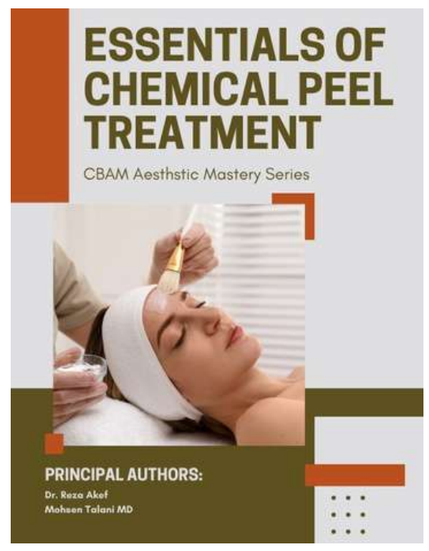


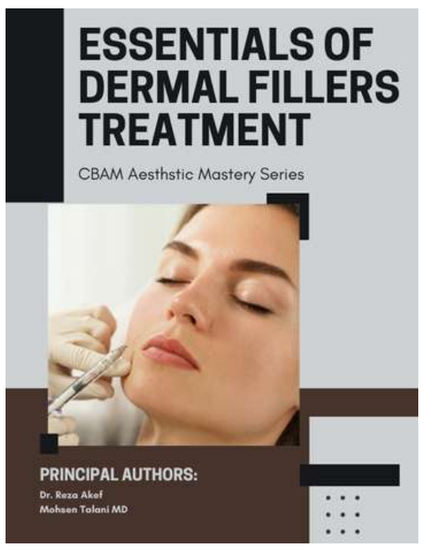












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Dr. Reza Akef is a highly experienced and respected cosmetic physician, with over 15 years of experience in teaching and practicing cosmetic medicine. He is currently the Assistant Professor at McMaster University and the Chairman of the Canadian Board of Aesthetic Medicine (CBAM), where he shares his knowledge and expertise with other healthcare professionals to provide the best care for their patients. Dr. Akef is board certified by the College of Family Physicians of Canada in both Family and Emergency Medicine. Additionally, he is deeply involved in interventional pain practice cooperation for the treatment of Migraines, chronic pain, TMJ, Myofascial pain, and Fibromyalgia.



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Mohsen Talani is the Director of CBAM. He has over 18 years of experience teaching anatomy in Canada and internationally to students and healthcare practitioners in different fields of medicine such as physicians, dentists, nurses, chiropractors, and physiotherapists.
After graduating from medical school at a young age, he became a medical doctor in his home country, Iran, and practiced in the field of emergency medicine. While pursuing his Master's thesis in neuroscience at McGill University, he discovered his passion for teaching. Since then, he has been working in the field of medical science education, with a focus on anatomy.

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