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Hypothyroidism and Alternative Treatment: An Overview



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ABSTRACT

Hypothyroidism may occur as a result of primary gland failure or insufficient thyroid gland stimulation by the hypothalamus or pituitary gland. It is usually associated with lipid abnormalities. Hypothyroidism is a common endocrine disorder resulting from deficiency of thyroid hormone or, more rarely, from their impaired activity at tissue level. In its clinically overt form, hypothyroidism is a relatively common condition, with an approximate prevalence of 2% in adult women and 0.2% in adult men. Deficiency of the hormone has a wide range of effects because all metabolically active cells require thyroid hormone ⁽¹⁾. Untreated hypothyroidism can contribute to hypertension, dyslipidemia, infertility, cognitive impairment, and neuromuscular dysfunction. The best laboratory assessment of thyroid function is a serum thyroid-stimulating hormone test. Thus a multifactorial and holistic approach is required in successfully managing the condition of hypothyroidism i.e., diet, drugs and yogic exercises all in combination helps in normalizing the thyroid function in hypothyroidism.

INTRODUCTION:

The thyroid is responsible for production and secretion of the thyroxine (T₄) and triiodothyronine (T₃) hormones and calcitonin throughout the body^(1,28-29). Regulation of Thyroid Hormones Thyroid hormones is regulated by the hypothalamic-pituitary-thyroid axis. The hypothalamus secretes thyrotropin releasing hormone (TRH) in a tropic fashion that activates the anterior pituitary to secrete thyroid stimulating hormone (TSH). TSH targets the thyroid and elevates thyroid hormone production. When adequate thyroid hormones are produced and secreted, the anterior pituitary stops secreting TSH via a negative feedback mechanism^(2,28-29).

DIFFERENT TYPES OF THYROID DISEASE^(3,29)

a. Hyperthyroidism: In hyperthyroidism, large quantities of thyroxine (T₄) and triiodothyronine (T₃) hormone levels are deposited into the blood stream resulting in symptoms and signs such as high metabolism, high blood pressure, rapid heart rate, increased nervousness and agitation, digestion problems as well fatigue and complaints of muscle weakness. In some cases, patients will develop a protruding, enlarged thyroid gland called a goiter. Hyperthyroidism is also referred to as thyrotoxicosis.

b. Hypothyroidism: Hypothyroidism is defined as failure of the thyroid gland to produce sufficient thyroid hormone to meet the metabolic demands of the body. Most common symptoms include weight gain, intolerance of cold, fatigue, depression, and poor memory⁽¹⁾. Untreated hypothyroidism can contribute to hypertension, dyslipidemia, infertility, cognitive impairment, and neuromuscular dysfunction⁽⁴⁾. The recommended daily intake of iodine is of at least 75 µg/day, which corresponds to 10 g of iodized salt, according to recommendations of the World Health Organization (one part of sodium iodide in 100,000 parts of NaCl)⁽⁵⁾. Prevalence is 1.9% in women, and it increases with age. Drugs classically associated with thyroid dysfunction include lithium, amiodarone, interferon α, interleukin-2, and tyrosine kinase inhibitors⁽⁴⁾. For hypothyroidism, treatment consists of substituting the deficient hormone, mostly with levothyroxine. The pharmacist's role in both hyper- and hypothyroidism is supportive, assisting the patient to reach a euthyroid state⁽⁶⁾.

Different types of hypothyroidism

a) Iodine deficiency: due to insufficient intake of dietary iodine, it is the most common cause of hypothyroidism worldwide, but also very easy to take care of. In areas of the world

where there is an iodine deficiency in the diet, severe hypothyroidism can be seen in 5% to 15% of the population.

b) **Surgical removal** of the thyroid to treat severe hyperthyroidism and/or thyroid cancer.

c) **Autoimmune thyroiditis:** it is a case in which the body interprets the thyroid glands and its hormone products T3, T4 and TSH as threats, therefore producing special antibodies that target the thyroid's cells, thereby destroying it. It presents with hypothyroidism or hyperthyroidism and the presence or absence of goiters. Specialists clinically separate autoimmune thyroiditis into two categories. If goiters are present, it is understood as Hashimoto's Thyroiditis. On the other hand, if the thyroid is atrophic, but does not present goiters, it is denominated Atrophic Thyroiditis⁽³⁾.

d) **Hashimoto's Thyroiditis:** The most common cause of hypothyroidism in the United States is an inherited condition called Hashimoto's thyroiditis. Hashimoto's is an autoimmune disease in which the body's immune system inappropriately attacks the thyroid tissue. In part, this condition is believed to have a genetic basis. Hashimoto's thyroiditis is permanent and requires lifelong treatment. Both genetic and environmental factors appear to play a role in its development ⁽⁷⁾. Blood samples drawn from patients with this disease reveal an increased number of antibodies to the enzyme, *thyroid peroxidase* (anti-TPO antibodies). Since the basis for autoimmune diseases may have a common origin, it is not unusual to find that a patient with Hashimoto's thyroiditis has one or more other autoimmune diseases such as diabetes or pernicious anemia (B12 deficiency). Hashimoto's can be identified by detecting anti-TPO antibodies in the blood and/or by performing a thyroid scan.

e) **Postpartum Thyroiditis:** If the symptoms of thyroiditis appear in women after giving birth, it is attributed to such and therefore called Postpartum Thyroiditis. The effects of this disease are not permanent but transient ⁽³⁾.

f) **Riedel's Thyroiditis:**

This is a rare autoimmune disorder in which scar tissue progresses in the thyroid until it produces a hard stony mass that suggests cancer.

g) **Autoimmune Thyroiditis Due to Pregnancy:** Hypothyroidism may also occur in women who develop antibodies to their own thyroid during pregnancy, causing the inflammation of the thyroid ⁽⁷⁾.

Pathophysiology:

Localized disease of the thyroid gland that results in decreased thyroid hormone production is the most common cause of hypothyroidism. Decreased production of T4 causes an increase in the secretion of TSH by the pituitary gland. TSH stimulates hypertrophy and hyperplasia of the thyroid gland and thyroid T4-5'- *deiodinase* activity. This, in turn, causes the thyroid to release more T3. Systemic effects are due to either derangement in metabolic processes or direct effects by myxedematous infiltration (that is, accumulation of glycosaminoglycans in the tissues). Subsequently, the effects of thyroid hormone deficiency on growth and development, on intermediary metabolism, on central nervous system development and function, and on cardiovascular, skeletal, gastrointestinal, and reproductive system activity have been characterized⁽⁸⁾.

Functioning of thyroid gland⁽⁸⁾:

Table No:1

System	Effect due to deficiency (hypothyroidism)
I. Growth and development	for the first two decades of life, irreversible fetal central nervous system, damage to CNS
II. Metabolism	Effect on basal metabolic rate, increased cholesterol and LDL Levels, decreased appetite
III. Nervous system	Headache, vertigo or tinnitus, relaxation of deep tendon reflexes, psychiatric disorders, cognitive deficits, and visual disturbances. Delayed neuro-psychomotor development and growth. ^(5,31)
IV. Cardiovascular system	decreased contractility, pulse rate and stroke volume are diminished, and cardiac output is often decreased to half the normal value
V. Gastrointestinal (GI) system	Achlorhydria, pernicious anemia
VI. Reproductive system	menstrual irregularities ^(30,31) , anovulation, and infertility ⁽³³⁾ (Stradtman, 1993), abnormalities of gonadal function ^(Joshi et al., 1993) , infertility ⁽³³⁾ and miscarriage.
VII. Musculoskeletal system	delayed relaxation of deep tendon reflexes ^(Aronow, 1995) . arthralgias, joint effusions, and pseudogout

Common symptoms and clinical findings, Diagnosis:

Physical examination may reveal a diminished thyroid gland, although sometimes the gland is normal or even enlarged (goiter) ⁽⁶⁾. The best laboratory assessment of thyroid function is a serum thyroid-stimulating hormone test ⁽⁴⁾. Laboratory tests may also reveal anemia on a full blood count, increased cholesterol, liver enzymes and prolactin, and low sodium ⁽⁶⁾.

Table No:2 Level of hypothyroidism ⁽¹⁸⁾.

State	Normal	At risk	Mild	Severe
TSH Level(mu/L)	0.4	2.5	2.5 <4.0	10.0 >10.0 in the neonates is suggestive of congenital hypothyroidism ⁽⁵⁾ .

Table No:3 ^(8,4,3)

<ul style="list-style-type: none"> ❖ Fatigue ❖ Dry skin ❖ Puffy face ❖ Puffy body ❖ Muscle cramps and weakness ❖ Joint pain ❖ Swelling of the legs ❖ Hypothermia ❖ Muscle cramps and weakness, weight gain; ❖ macroglossia ; ❖ goiter; ❖ Lack of libido, ❖ Menorrhagia , ❖ Myalgias , ❖ Weakness, Weight gain, hoarseness; ❖ Vague aches and pains ❖ pitting edema of lower extremities; ❖ hyporeflexia with delayed relaxation, ❖ ataxia, or both ^(8,4). 	<ul style="list-style-type: none"> ❖ Hoarse voice ❖ Goiter ❖ Irregular or absent menstrual periods ❖ Infertility ❖ Weakness ❖ Depression ❖ Irritability ❖ Nervousness ❖ Strong emotional reactions ❖ Weight gain ❖ slowed speech and movements; ❖ jaundice; ❖ pallor; coarse, brittle, straw like hair; ❖ loss of scalp hair, ❖ axillary hair, pubic hair, or a combination; dull facial expression; ❖ coarse facial features; ❖ periorbital puffiness; 	<ul style="list-style-type: none"> ❖ Difficulty/inability to concentrate ❖ Memory loss ❖ Slow speech ❖ Slow movements ❖ Cold intolerance ❖ Excessive sleepiness ❖ Dry, coarse hair ❖ Eyebrows thinning ❖ Constipation. ❖ decreased systolic blood pressure and increased diastolic blood pressure; ❖ bradycardia; ❖ Increased cholesterol levels, ❖ pericardial effusion; abdominal distension, ❖ ascites (uncommon); non-pitting edema (myxedema);
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Prevention

- ✓ No universal screening recommendations exist for thyroid disease for adults. All neonates mandated to be screened at birth.
- ✓ The World Health Organization recommends a daily dietary iodine intake of 150 mcg for adults, 200 mcg for pregnant and lactating women, and 50 to 120 mcg for children (Shikha et al., 2010).
- ✓ The American Thyroid Association recommends screening at age 35 years and every 5 years thereafter, with closer attention to patients who are at high risk (e.g., pregnant women, women >60 years, patients with type 1 diabetes or other autoimmune disease, patients with history of neck irradiation) (American Association of Clinical Endocrinologists, 2002) ⁽⁸⁾.

Treatment:

1. Drug treatment:

TH replacement is the simplest among all hormone replacement therapies. The drug of choice is levothyroxine (L-T4 sodium salt), which allows measuring serum T4 levels to assess the efficacy of treatment and adjusting doses. Levothyroxine has a mean life of 7 days, and the maximum response is reached in the second week of treatment when great part of T3 will have been converted^(5,10).

2. Alternative Healing Therapies:

➤ Merits :

The alternate therapy explains the cause of hormonal imbalances as insufficiency in iodide uptake. The choice of treatment is the practice of yoga to enhance the absorption power of the gland to trap more iodides from the blood and supplement the production of hormones ⁽⁷⁾. In the study of Ayurveda for thousands of years, Indian practitioners have adopted ways to account for your body constitutional type: your physical, emotional, and psychological makeup in healing all ailments and restoring the body to its beautiful healthy state. Chinese medicine has long since proven that therapies such as acupuncture and pressure point massage are helpful to relieve stress and correct hormonal imbalances ⁽¹⁾. In cases where the gland is malfunctioning and making the other disorders to crop up alternate therapies can do better ⁽⁷⁾.

➤ **Demerits:**

The alternate therapy cannot be adopted in cases where the gland is totally absent, misplaced or becomes totally defective and needs its removal. In some cases where low secretions are noted at one point of time become high secretions at another time for many reasons. In these cases, the alternate treatment fails ⁽⁷⁾.

Ways of treating: ⁽³⁾

- Avoid goitrogens
- Lifestyle changes
- Medication – thyroid hormone substitution
- State of mind
- Seek out healthy fats
- Add a probiotic to the daily routine
- Chakra healing: The thyroid is located in the part of our body that corresponds to the throat chakra. The throat chakra is the center of energy in the body that is about speaking and hearing your inner truth and the truths of others. It is the center of self-expression, communication, listening, and creativity. It is also related to creativity, addiction, criticism, faith, decision making (choices), will, and lack of authority. The thyroid will mirror an imbalance in this chakra and vice versa.
- Yoga therapy
- Among a few other healing methods, acupuncture and Chinese medicine can be very helpful as well as *Tai Chi* and *Qi Gong*.

Thyroid Disease and Yoga Therapy:

Yoga is a state which is defined as a high level of consciousness achieved through a fully rested relaxed body and a fully awake and relaxed mind ⁽¹¹⁾. A proper yoga plan will include deep relaxation through meditation, slow and therapeutic asana practice that leads to strengthening the body and awareness on mind, body and breath, engaging pranayama and more meditation after asanas, and mudras for further meditation ⁽⁸⁾. Yogic exercise improves body functions through the manipulation of cardiovascular, respiratory, metabolic control mechanism ⁽¹¹⁾. Yoga asanas have record breaking histories of treating incurable diseases

caused due to the ill- management of the endocrine system and its components. The point is that these asanas of yoga show a direct and pin- point effect on the various glands of the body, among which are the thyroid, the pituitary, parathyroid, adrenal, pancreatic and reproductive glands^(7,12,20-27).

In general, asanas that compress and stretch the throat area are beneficial to the thyroid and are helpful both for hyper and hypothyroidism as they stimulate the blood flow, which provides nourishment to the cells and helps the thyroid to do its work properly. Among Pranayamas, Ujjayi is the most effective pranayama for thyroid unbalance as it directly acts on the throat area and has a relaxing and stimulating effect. It also has a warming effect which will help people whose thyroid unbalance make feel constantly cold⁽³⁾. Thyroid disease is becoming common - with proper attention and awareness of the deep physiological therapies available through yoga one can find personal freedom from the disease and in some cases reverse the disorder. Once you remove stress, continue with meditation, asanas and breathing pranayama to nourish your body. Yoga teaches us that the body is a tool for reaching the experience of bliss⁽¹⁾. A previous study has demonstrated that three months of pranayama training modulates ventricular (thyroidal fraction)performance by increasing parasympathetic activity and decreasing sympathetic activity (Udupa 2003)⁽¹³⁾.

Yoga program for therapy⁽¹⁾:

Table No:4

Asana Name or Technique / Therapy Series / Add-Ons:	Duration(min)
Opening Meditation	5
Opening Prayer, So Ham Meditation/Chant	5
Joint Movements, Ankle Stretching Breathing, Side Stretch or Ardha Kati Chakrasana, Hand Stretching Breathing, Spinal Twist 2	Generally 2-4 min.
Padangusthasana, Vajrasana, Anjaneyasana, Vagra Swasa Breathing, Tadasana	2-5 min
Finishing Sequence with Savasana (15 min)	29 min

Table No:5 ^(1,3)

Foundation Sequence	Finishing Sequence	Pranayama, Bandhas, Kriyas	Mudras & Bandhas	Yogasana ⁽³⁾
1. Surya Namaskara	I. Dandasana	I. Closing Prayer	I. Chin	I. Sarvangasana
2. Padangusthasana	II. Paschimottanasa	II. Shitali Pranayama	Mudra	II. Halasana
3. Vrikshasana	na	III. Bhramari Breath	Nastrika	III. Karnapidasana
4. Garudasana	III. Baddhakonasana	IV. Ujjayi Breathing	Mudra	IV. Matsyasana
5. Utthita-Hastapadasana	IV. Gomoukasana	V. Nadi Suddi (no	II. Bhairavi	V. Paryankasana
6. Trikonasana Classical	V. Urdhva Prasarita	Kumbhaka)	Mudra	Supta Vajrasana
7. Parshvottanasana	Padasana	VI. Kapalbhathi	III. Yoni	VI. Uttana-
8. Virabhadrasana A	VI. Jathara	VII. Uddiyana Bandha	Mudra	Padasana
9. Adho Mukha Virasana	Parivartanasana	VIII. Agni Sara Kriya	IV. Hridaya	VII. Setubandhasana
10. Bhujangasana	VII. Ananda Balasana	IX. Om Kara Chanting	Mudra	Vipareeta
Breathing	VIII. SAVASANA		V. Uddiyana	Karani Mudra
11. Dhanurasana (legs only)			Bandha	
12. Supta Virasana				



Ujjayi can be performed throughout all the series. An increase of 19% in oxygen consumption has been observed during the practice of one type of pranayama called the Ujjayi -Pranayama⁽¹¹⁾. It is a good way to start the series as it is 20-30 breaths with retention if comfortable. Then as a gentle warm up, six rounds of, which will also after that, following all asanas can be held for 6 long breaths⁽³⁾.

Table No: 6 ^(1,3,14,7,12,20-27)

Name of asanas /kriyas	Benefits for hypothyroidic patient:
i. Batrika Pranayama	Invigorating and wakes up body, mind and breath.
ii. Surya Namaskara	brings energy and wake up body, mind and breath.
iii. Vrikshasana	Help with concentration.
iv. Utkatasana	Helps determination, mental and physical strength, and is a good way to balance the lassitude and depression. It also activates the abdominal organs, which is needed to help the slow digestion.

v. Garudasana	To improve concentration, effect on the memory power
vi. Trikonasana Classical	Improves function of the abdominal organs, helpful for digestion, and helps reducing waist fat
vii. Parshvakonasana	Strengthens legs, waist and back muscles and activates abdominal organs, good to bring back muscle tone and continue with the digestive benefits.
viii. Virabhadrasana	For hypothyroidic people in many ways: very good against depression, brings courage and determination,
ix. Sirsasana	Gives energy, improves memory and has a beneficial effect on the circulation to the glands.
x. Bhujangasana breathing	Strengthen abdomen and back
xi. Dhanurasana breathing and Dhanurasana	Activates the digestion, wakes up the abdominal area and helps relieve constipation.
xii. Parighasana	Activates abdominal area and prepares for back bends
xiii. Ustrasana/Ardha Ustrasana	Good stretch on the throat, so good for the thyroid
xiv. Supta Virasana –	Very good for the digestion
xv. Paryankasana	Improves memory and stretches the throat
xvi. Pavanamuktasana Kriya breathing (wind release)	Good help for digestion and in case of constipation. Also, has a good effect on thyroid.
xvii. Chakrasana	Brings energy and helps to fight depression. Brings courage and mental strength
xviii. Rocking	To avoid back pain after Chakrasana.
xix. Setubhandasana breathing and Setubhandasana	Beneficial effect on thyroid
xx. Bharadvajasana	Rebalancing the Ida and Pingala channels. Good for the digestive system.
xxi. Purvottanasana	Good opened up pose with a good stretch of the throat.
xxii. Pascimottanasana	Good focus on lengthening and strengthening the core
xxiii. Marichyasana C –	More activation on the abdominal organs.
xxiv. Ardha Matsyendrasana	Powerful on the balancing of the Ida and Pingala channels, and good on the digestion improvement. It also helps to reduce menstruation disorders,
xxv. Meditation	most powerful tools for healing

xxvi. Kriyas: Sankalapraksalana and Vamana Dhouti	Helpful to cleanse the system as the thyroid disorder might be related to some unbalances in the digestive system.
xxvii. Sarvangasana	Blood circulation increases to the brain. Brain is going to be purified by getting more blood with deep breathing.
xxviii. Halasana	Tones up thyroid gland, improves memory, functioning of thoracic and abdominal viscera.
xxix. Viparithkarani	Increase the tone of the Mula Bandha, bladder and anus activities by stimulating the perineum, Blood flow increase to the brain.

Ayurvedic Treatment:

Ayurvedic medicines are also used to control the hypothyroidism as the side effects are very less in this system of medicines. Hypothyroidism is notorious, the symptomatic treatment is followed according to the suitability of the individual cases, i.e., sthoulya, sodha etc⁽⁹⁾. The treatment of Ama Dosha can be useful in Hypothyroidism⁽¹⁵⁾. According to Ayurveda, Hypothyroidism can be considered as krichrasadhya (chronic ailment) as vitiation of Dhatvagni once created can't be corrected easily, so it takes time to reverse the pathological changes takes place due to Hypothyroidism⁽¹⁶⁾. Ayurvedic management can be done by the followings⁽¹⁶⁾:

- Nidana Parivarjana
- Samshodhana Chikitsa
- Samshamana Chikitsa

Table No: 7 ⁽¹⁷⁾

Herbal Treatment of Hypothyroidism: (Roleplaying)	Type of herb	Examples
As a support	General herb/ Ayurvedic formulation	Black walnut, chickweed, Rhodiola, Oregon- grape ⁽¹⁸⁾ , Trikatu, Triphala, Varuṇa twak, Panchkola, Coconut Oil

		(16)
As a support	Specific Herbal formulation of Ayurveda	<p>1. Vati/Guggulu - Kanchnara Guggulu, Punarnavadi Guggulu, Vyoshadi Guggulu, Arogyavardhini vati, Agnitundi vati, Vishmusti vati, Chandraprabha vati</p> <p>2. Churna – Panchakola Churna, Trikatu Churna</p> <p>3. Rasayana Therapy - Pippali Vardhamaana Rasayana, Shilajatu Rasayana, Triphala Rasayana, Lauh Rasayana⁽¹⁶⁾.</p>
As a support	Seaweeds	Fucus spp. (bladder wrack), Laminaria spp. (kombu), Undaria spp. (wakame), Sargassum spp. (sargasso weed), Postelsia palmaeformis (sea palm).
As a support	Adaptogen Herbs and Adrenal Tonics	Centella, Withania, and Eleutherococcus, herbes which support thyroid function indirectly include: Panax, Oplonanax, Aralia (berries), Codenopsis, Ganoderma, Glycyrrhiza, and Schisandra.
As a support	Hepatics	Berberis (Oregon grape), Silybum marianum (Milk thistle), Curcuma longa (Turmeric), Rumex Crispus (Yellow dock), Artemisia (mugwort), Ceanothus (red root), Cynara (artichoke leaves), and Taraxacum (dandelion).
As a support	Lymphatic Herbs	Ceanothus americanus (Red root), Galium aparine (Cleavers), Phytolacca americana, P. decandra (Poke)

As a support	Immune Modulating Herbs	Astragalus, Codenopsis, Ligustrum, Ganoderma, Paeonia lactiflora, Panax ginseng, Panax quinquefolium, Poria, and Baptisia.
As a support	Female Hormone Balancing Herbs	Vitex agnus-castus (Chaste tree berry), Cimicifuga racemosa (Black cohosh), Angelica sinensis (Don quai) .
As a support	Demulcents and Astringents	Althea (marshmallow), Trigonella (fenugreek), Rosa (rosehips), Myrica californica (California bayberry).

Naturopathy:

Naturopathy can be defined as a drugless, non-invasive, rational and evidence-based system of medicine imparting treatments with natural elements based on the theories of vitality, toxemia and the self-healing capacity of the body, as well as the principles of healthy living. Naturopathy considers human body as a complete unit and the treatments are based on panchamahabhutas (Five great elements- air, water, space, fire and earth). Naturopathy is a wholesome approach intended to heal the underlying cause by averting the root cause of the disease. It also provides a healthy internal environment to the body to accelerate its healing mechanisms. In some studies, the naturopathy showed the beneficial effect ⁽¹⁹⁾.

Homeopathic Treatment

Homeopathy remedies for hypothyroidism are chosen to offer individual treatment based on the study of patient's underactive thyroid, its extent, cause, genetic pattern, emotional sphere, hormonal imbalance, mental, physical, and so on. Homeopathic system of medicine uses the plants extract, animals and mineral in different proportion according to patient history. The different medicines used are Kali-crab, Sepia, Natrum-muritiu, Lycopus, Spigelia, Sponiatosta, Calcarea iodatum, Ferru iodatum⁽⁹⁾.

CONCLUSION

By referencing sources mentioned below, we come to across the facts that Laboratory assessment of thyroid function is the optimal approach to confirm the diagnosis. However, thyroid function tests may not accurately reflect thyroid status in individuals with non-thyroidal illness, conditions that affect thyroid binding to plasma proteins, and thyroid

hormone resistance⁽⁸⁾. Thus a multidisciplinary rational and holistic approach are required in successfully managing the condition of hypothyroidism i.e., diet, drugs and yogic exercises all in combination helps in normalizing the thyroid function in hypothyroidism.

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