



Dr Vanderpump's Patient Information

## Hypothyroidism

### About the thyroid and its function

The thyroid is a butterfly shaped gland in your neck which is situated just below your Adams Apple (the larynx). A normal thyroid gland is neither visible nor can be felt if you apply finger pressure to your neck.

It is the thyroid gland's job to produce hormones, which regulate the body's metabolism of virtually all cells in the body, this includes your body temperature, heart rate, blood pressure and metabolism.

It does this by producing two thyroid hormones:

- Thyroxine (or T4) – which is inactive and is a “prohormone”
- Tri-iodothyronine (or T3) which is the active hormone

20% of T3 is produced directly by the thyroid gland. The remaining 80% is by removal of an iodine molecule from T4 by the action of enzymes in the liver or kidneys.

When you are healthy your brain secretes thyrotrophin-releasing hormone (TRH) from the hypothalamus and your pituitary gland secretes thyroid stimulating hormone (TSH). Together these hormones regulate the overall production of T3 and T4 - a clever loop known as the “hypothalamic-pituitary -thyroid axis”

### Hypothyroidism

If you have hypothyroidism it means you have an underactive thyroid. The consequence of this is that you are not producing enough thyroid hormone, so your body slows down.

About 2 in 100 people in the UK have hypothyroidism and it is ten times more common in women.

Primary Hypothyroidism is a result from direct impairment of the thyroid gland's function. The two main causes that make up 90% of cases in the UK are:

1. Autoimmunity - when thyroid cells are destroyed by your body's own antibodies. This is known as Hashimoto's thyroiditis
2. In patients who have an overactive thyroid or thyroid cancer where successful treatment has resulted in an underactive thyroid

Rare causes of Primary Hypothyroidism are:

- Inflammatory responses in the thyroid due to viruses or drugs such as amiodarone or lithium
- Abnormal thyroid development in the foetus
- Genetic defects in thyroid function
- Iodine deficiency (rare in the UK but 2 billion people worldwide)

Secondary Hypothyroidism refers to a failure of the pituitary to produce TSH due to pituitary or hypothalamus problems.

#### **Symptoms of Hypothyroidism include:**

- Fatigue and lethargy
- Cold sensitivity
- Dry skin
- Lifeless hair
- Impaired concentration and memory
- Increased weight with poor appetite,
- Constipation
- A hoarse voice
- Tingling of the hands
- Heavy periods and later absent periods
- Deafness
- Joint aches

In childhood there may be delayed development and in the adolescent puberty may be delayed. The elderly may develop memory disturbance, an impaired mental state or depression and in rare cases coma can occur resulting in death if left untreated.

#### **Signs of Hypothyroidism**

- Puffy face
- Cool dry skin
- Slow pulse rate
- Thinning of the hair including eyebrows
- Slow tendon reflex relaxation time
- Slow pulse rate
- Hoarse Voice

Some patients may have a goitre due to the inflammation associated with autoimmunity, but in others the thyroid is destroyed.

#### **Diagnosis**

Nowadays an early diagnosis can usually be achieved through increased awareness of the condition and greater availability of blood tests.

## Treatment

Thyroxine (or Levothyroxine) is the current standard thyroid replacement. The goal of the treatment is to reverse the symptoms of hypothyroidism by normalising and maintaining the blood TSH level.

The TSH blood test is successful in establishing the correct dosage of thyroxine, because of the feedback loop between the thyroid hormone in the blood and the pituitary. When the thyroid hormone levels are low, TSH levels rise, and conversely when the thyroid hormones are high, the TSH levels fall. The pituitary is very sensitive to changes in circulating thyroid hormone levels and the amount of TSH it secretes. It is therefore a useful yardstick to measure how much thyroid hormone the body is exposed to.

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