Hypothyroidism

Hypothyroidism develops when the thyroid gland can't produce enough thyroid hormone (either T3 or T4). This causes TSH (thyroid stimulating hormone) to rise. TSH is produced from the pituitary gland and its action is to stimulate the thyroid. We can easily measure these hormones and then correct the hormone deficiency with synthetic thyroid hormone (levothyroxine).

So, treating hypothyroidism should be simple.

Sadly, this isn't so.

In reality many patients with hypothyroidism don't get treated well.

But why should this be?

Too Much Reliance on One or Two Tests

The symptoms of hypothyroidism include fatigue, feeling cold much of the time, dry skin and hair, cold hands and feet, brittle nails, low libido, constipation, turning red with exercise and weight gain. The fatigue is typically better in the morning. This disease is thought to affect one in ten of us and is commoner in women and as we get older.

None of these symptoms are specific but if you have a few of them then you could well be hypothyroid even if some of the tests come back normal.

Any one of the following tests could confirm hypothyroidism with the symptoms mentioned above: a raised TSH, a low T4, a low T3 or having thyroid antibodies.

The problem is that some tests are done much more than others. The TSH is done most of the time, the T4 sometimes, the T3 less often and thyroid antibodies quite rarely. So, you can see how the diagnosis can be missed.

The TSH Test

Unfortunately, many doctors think hypothyroidism has been excluded if the TSH is normal. It hasn't.

Most doctors rely far too much on the TSH test. (*Dr Kenneth Blanchard, author of the Functional Approach to Hypothyroidism claims reliance on TSH is the biggest single medical error of modern times*).

The most common mistake I see is that often the only test done both to investigate and to monitor hypothyroidism is the TSH. This means many patients with borderline hypothyroidism get missed or undertreated.

The Tests get Misinterpreted

Another problem is interpretation of the test. In the UK the TSH is considered to be raised if it is above 5 (in the USA it is above 3). However, some specialists believe a trial of thyroid hormones is warranted if the TSH is above 4 (see the book, Thyroid Power).

T3 is Crucial

The goal in treatment of hypothyroidism is to produce enough T3. This is the active hormone. It doesn't matter how much T4 you have. If it isn't converted to T3 your thyroid gland won't function properly.

Some 59% people with hypothyroidism have abnormal gene causing poor conversion T4 to T3. In addition, we need **iodine, selenium, iron** and copper to convert T4 to T3 (see below). The majority of people are low in **copper** (see leaflet on copper) and many are short of iodine (see leaflet on iodine) and selenium. In people who can't make enough T3 from T4, the T4 level will be normal but their T3 will (usually) be low. However, testing T3 can be unreliable as it is a short-acting hormone and levels vary throughout the day.

There's also a **chemical that interferes with the conversion of T3 to T4**. This chemical is BPA (Bisphenol A). It's a plastic and it's everywhere. It's used in the lining of tins (including baby food), till receipts (it will get on your hands from touching these), processed foods and hard plastic materials. It's also strongly linked with heart disease and also linked with auto-immune disease.

One test which is not available on the NHS (but can be done privately) is reverse T3. This is a by-product of T4 to T3 conversion. If conversion is difficult there will be more reverse T3 leading to a vicious cycle which blocks T3 even further. A T3/reverse T3 ratio of less than 10 strongly suggests T3 is needed.

Treatment is Highly Individual

Some patients do very well with levothyroxine (synthetic T4 hormone). This is usually gradually increased until the thyroid tests return to normal. Ideally the tests should show free T4 in the upper range of normal (normal range: 12 -24 pmol/l) and TSH in the lower range of normal. However, some people only feel better when the T4 is slightly above normal and the TSH is below normal (this makes doctors uneasy as the tests are abnormal even though the patient is well).

But many **don't feel well even when the tests return to normal**. Why? Sometimes the levothyroxine is not high enough; it may just need increasing until wellbeing returns. However, there is a fine line between too little and too much thyroid hormone and if it is pushed too high the likely symptoms are like someone who has had too much coffee: the person feels wired, with twitching muscles, feeling too hot, palpitations, poor sleep. **How the patient feels is nearly always a better guide than the lab results**.

Some people need T3 to feel well. Liothyronine (Tertroxin) is synthetic T3. Unlike levothyroxine it needs to be given several times daily (3-5 times). **Some people only get better with T3 alone**, (see Paul Robinson's book and website: https://paulrobinsonthyroid.com/about/ for an example of someone who experienced this. You can see it's getting a bit complicated. But it can be worked out. What is needed here is some flexibility and prepared to do some experimentation to find what works best for each individual patient.

A few people do best with natural thyroid preparations. Natural desiccated thyroid was standard treatment until 1985. This contains not only T4 (as with levothyroxine) but also T1, T2 and T3. Although it has been assumed that T1 and T2 are inactive we don't fully understand their role and nature normally has a purpose for the hormones it produces. Most people taking natural desiccated thyroid have noted they feel better with this compared to levothyroxine. Presently these are prescribable but as an unlicensed medicine. This means some doctors may feel uncomfortable prescribing them.

It is possible to buy natural desiccated thyroid as Metavive 1 and 2. (Metavive 2 contains 30mg of desiccated thyroid extract whereas Metavive 1 contains 15mg). It is combined with ribonucleotides which are the building blocks of RNA and DNA and thought to work together with the extract.

The highly experienced American functional practitioner, Dr Neil Nathan uses a form of sustained-release T3 made by compounding pharmacists (which works better than short-acting T3). He uses this in patients not responding to levothyroxine and he has found this to be effective in 4-5000 patients and very safe. But the **most intriguing part to this story is he finds once patients have been on the correct dose for 3-6 months, they can be weaned off it and never need thyroid treatment again.** This is truly remarkable, as for nearly all patients on conventional treatment are on treatment for life.

How to Take Thyroid Hormones

Levothyroxine is usually taken daily about half an hour before breakfast. However, Dr Blanchard finds taking it with meals works better and uses it twice daily with the last dose after the evening meal. Many people need extra thyroid hormone in winter (thyroid hormone warms you up – see below).

An Additional Thyroid Test

Dr Barnes developed a simple and accurate method of detecting hypothyroidism. This involves taking the temperature under the armpit first thing in the morning after waking. The reason for this is that body temperature normally decreases by a tenth of a degree overnight but in hypothyroidism it can go down as low as degrees.

Take the temperature before getting out of bed. Avoid alcohol on the previous night. Leave the thermometer in place under the armpit for 10 minutes. Normal temperature should be between 97.8 and 98.2F (36.6 and 36.8C). **A reading under the arm below 97.3 F (36.2C) or in the mouth of below 97.8F (36.6C) in the morning before getting out of bed suggests hypothyroidism.** Do it on several different days. For menstruating women, the temperature varies through the cycle so take the temperature on the 2nd to 5th day of the period.

Although a basal thermometer (used for detecting ovulation) is best it is not essential. Mercury thermometers are more accurate than digital. It is also possible to take the temperature in the mouth but the readings are 0.5 -1.0F higher. Leave the thermometer in the mouth for 5 minutes. A reading below 97.8 F (36.6C) (in the mouth) would suggest hypothyroidism. Take on at least 3 days.

Another way of doing this is to take your temperature four times a day for one week at various times. An average reading of 97.8F or below would suggest hypothyroidism.

It is also useful to check the pulse which is lower in hypothyroidism.

Nutrient and the Thyroid

A common problem is poor conversion of the major hormone T4 into its active form T3. This step needs **selenium** as a cofactor (normal dose 200mcg daily). It also requires **zinc** (use 25mg daily). A study in 2015 found T3 was increased by giving zinc and selenium, but not selenium alone. Cortisone (from too much stress) can also reduce conversion of T4 to T3 as can beta-blockers.

Thyroid hormones are made from **tyrosine** and **iodine**. Tyrosine is rarely deficient. However there has been some debate about iodine. In the past iodine has proved an effective treatment for hyperthyroidism (too much thyroid hormone) - see iodine leaflet - but there has been some concern it can suppress thyroid function in hypothyroidism.

Iodine can help in hypothyroidism. However, the thyroid can be sensitive to iodine and go from low to high thyroid quite quickly in some people so it needs to be used with care. Iodine deficiency is still common, but the jury is out on whether iodine helps in hypothyroidism. One problem is it is poorly absorbed when oestrogen levels are raised (which is common). It is also blocked by other halogens which are also widespread in the environment. Please note that iodine can temporarily increase TSH.

Halogens include fluorides (toothpaste, non-stick teflon pans, many drugs such as fluoxetine, it is also found in tea), chlorine (tap water, swimming pools and chlorinated chemicals) and bromides (flame retardants, some breads, personal care products). (A study found those taking 3 tablets of iodine (called Iodoral) excreted three times as much bromide and fluoride in their urine). Unfortunately, too many halogens block iodine and hence thyroid hormones.

These toxic halogens can also block thyroid receptors (the Gq/11 receptor) fooling the body into thinking that there is enough thyroid, leading to the production of inactive thyroid hormones and lowering TSH. The result of this is that the tests can appear normal but thyroid function can be low. My take on this is that if you suspect that you are being exposed to halogens then take some iodine (se iodine leaflet for details). Levels of iodine can be tested in specialised labs but not on the NHS.

Vitamin A is also needed for thyroid receptors to work normally.

Why is this Disease so Common?

The answer is firstly **endocrine disrupting chemicals** (gender-benders) which abound in the modern world and secondly an increase in halogens in the environment (chorine, fluoride and bromide) which compete with iodine. Perfluorinated chemicals found in non-stick pans have also been implicated in thyroid disease.

Gender-benders are found in many products today but notably in plastics, particularly when heated, and in pesticides. A particular concern is **perfumes**. All of major brands of perfume have been found to have three to six different gender-bender chemicals in them. Perfumes are often sprayed onto the neck where they directly affect the thyroid. Levels of endocrine disruptors can build up over time. Read the label. The label "fragrance" usually means endocrine disrupting chemicals are being used, but other endocrine disruptors include methyl benzylidene and bisphenol A. Avoid those with the label "fragrance", unless it says "phthalate-free". Some perfumes are available that are free of endocrine disruptors such as Henry Rose and Abel. Another useful tip is to use the perfume on your clothes not on your skin, as most chemicals are rapidly absorbed through the skin.

Another problem is EMFs (electro-magnetic fields).

Electro-magnetic Fields (EMFs)

The thyroid gland's location in the neck makes it particularly vulnerable to electromagnetic radiation exposure from mobile phones. The radiation from these phones comes from the base of the unit. Multiple studies have confirmed the link between mobile phone use and thyroid disease. Research on university students found significant differences in mean TSH levels between severe mobile phone users and control groups, as well as between moderate users and controls, suggesting that EMFs emitted by mobile phones are damaging the thyroid gland. NCBI [2]. Studies have also shown an association between EMF exposure and increased TSH levels and low T3 and T4 levels, demonstrating how hypothyroidism can be caused or worsened by mobile phone use MDPI [3]. Animal studies back up these findings.

There appears to be a dose-response relationship, with one study finding that students exposed to over 33 hours per month of cell phone use showed changes in thyroid-stimulating hormone levels AHA Journals [5]. Cellular changes have been observed after exposure to non-ionizing

radiation, with results directly related to the amount and duration of the EMF radiation. HEART UK [1].

A study in 2016 compared computer workers with non-computer users. Computer users had lower levels of T3, T4 and TSH. However, computer users given zinc had no reduction in these tests.

The dangers from EMFs are not widely appreciated by doctors. To me, it makes sense for anyone with a thyroid disorder to keep their exposure to mobile phones to a minimum.

Auto-Immunity

Hypothyroidism is thought to be an auto-immune disease. Exactly why this happens isn't fully understood but what we do know is **chemicals can trigger auto-immunity** so keep exposure low. We also know Vitamin D helps auto-immune disease. Professor Coimbra has found there is often **vitamin D resistance in auto-immune disease** and large doses may be needed. Fortunately, Vitamin D is very safe. Dr Cannell of the Vitamin D Council has said there has never been a case of Vitamin D toxicity found anywhere in the world for those taking 10,000 IU daily even long-term (this is the sort of dose you would get when sunbathing). I suspect most patients with auto-immune disease need Vitamin D in the 5000-10,000 IU daily range with some needing much more (see leaflets on Vitamin D and MS pioneers).

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Exercise

Exercise increases thyroid secretion and increases the sensitivity of cells to thyroid hormone.

Summary

Good management of hypothyroidism needs a flexible approach and a doctor who regards the patient's symptoms as being as important as the lab tests.