SELF-HELP LEAFLET NO. 1

WHAT IS HYPOPARATHYROIDISM?

Medical Disclaimer: The information contained in this leaflet is given in good faith and intended for information purposes only and should not be used as a substitute for professional medical or psychological treatment and care.

♦ What is Hypoparathyroidism?

Hypoparathyroidism is the name of a rare group of disorders where there is a deficiency or inactivity of parathyroid hormone in the body.

♦ Causes of Hypoparathyroidism

Thyroid or other neck surgery

Hypoparathyroidism may occur after thyroid, parathyroid or other neck surgery where the parathyroid glands are either damaged or removed. As a result there is insufficient parathyroid hormone for normal calcium regulation. Secondary thyroid or other neck surgery has a higher incidence of risk of Parathyroid gland damage or removal.

Idiopathic Hypoparathyroidism

This is a rare disorder which may be inherited or acquired later in life. It is characterised by the absence, fatty replacement or atrophy of the parathyroid glands. The **Familial** form of this disorder may be inherited as a sex linked recessive autosomal recessive or autosomal dominant with variable penetrance. The **Sporadic** form usually affects children and is often associated with Addison's disease, pernicious anaemia or premature ovarian failure.

Pseudohypoparathyroidism

Is a rare genetic disorder where the parathyroid glands are able to produce secretions of parathyroid hormone but the body is unable to respond or act upon it. It can affect the parathyroid glands in isolation or it can be part of a syndrome which involves many organs.

Pseudopseudohypoparathyroidism

This version of the disorder is where patients express only AHO phenotype and there are normal serum calcium levels and no other evidence of hormonal resistance. Treatment is the same as other types of Hypoparathyroidism but patients with the Albrights Hereditary Osteodystrophy may require treatment specific for skeletal disorders.

♦ Other related disorders

DiGeorge Syndrome

Is a rare complex group of congenital malformations and it arises from the faulty development of two of the pharyngeal pouches during the early development of the foetus and involves the abnormal actions of both the parathyroid glands and the thymus glands. Patients with this disorder are prone to recurrent infections and seizures.

Osteomalacia

This is a disease that causes softening or brittle bones due to insufficient levels of calcium in the body.

♦ What are the Parathyroid Glands?

They are four very tiny but blood rich glands situated in the neck just behind the thyroid gland.

♦ What do Parathyroid glands do?

As part of a more complex feed back loop which includes parathyroid hormone, vitamin D and to some extent phosphorous and magnesium it is the role of the parathyroid glands to automatically and precisely monitor our blood calcium levels and keep it

within a very finely tuned ‘normal’ range. It does this by secreting more or less parathyroid hormone in response to any fluctuations in the level of calcium in our blood.

♦ How does Parathyroid Hormone work?

- Blood calcium levels begin to drop
- The parathyroid glands sense the drop and automatically release parathyroid hormone into the blood stream.
- Parathyroid hormone stimulates the actions of vitamin D in the kidneys and intestines.
- Bone releases more calcium into the blood.
- Intestines absorb more dietary calcium.
- Kidneys conserve calcium by not allowing it to be secreted in urine and it is ‘recycled’ back into the blood stream.
- Blood calcium levels begin to rise to a ‘normal’ level and parathyroid hormone secretions automatically cease.
- As soon as calcium levels begin to drop again the whole process starts all over again

♦ What is the role of calcium in our body?

Calcium is essential to our body because it fuels the ‘electrical’ energy we need for the smooth running of our nervous system and muscle contractions, including our heart. It also provides the strength and maintenance required for healthy bones and teeth and is involved in the clotting process of our blood as well as having an influence on our mood and feelings of well being.

♦ What happens in when the action of parathyroid hormone is missing?

In the condition of Hypoparathyroidism the essential actions of parathyroid hormone on various target organs in the body to activate vitamin D to begin to utilise calcium is missing.

In order to compensate for this ‘missing’ essential first step in the calcium feed back loop, doctors are able to prescribe an oral vitamin D analogue which will act on the intestines to absorb dietary calcium and raise the levels of calcium in the blood.
Although the actions of Vitamin D analogues are life saving for patients with Hypoparathyroidism it does not completely solve their calcium problems. Unlike the automatic actions of parathyroid hormone, the vitamin D analogue is not able to either regulate or precisely maintain the level of calcium in the blood nor can it influence the kidneys to reabsorb calcium and ‘recycle’ it back into the blood stream.

This results in larger than normal amounts of calcium passing through the renal system and being excreted in urine and increased risk of renal problems or stones. It is for this reason that doctors prefer to keep their patients blood calcium levels at the lower end of the normal laboratory range and to keep their total daily dietary intake of calcium to a maximum of 2000mg if possible.

In the absence of the automatic control of the parathyroid glands the responsibility for managing blood calcium levels is shared between the patient and their doctor. Your doctor will establish an adequate treatment regime and take regular blood tests to monitor calcium levels as well as making periodic renal health checks. The patient will make
daily observations for any symptoms of low calcium and report any changes back to their doctor who will make an assessment if more blood tests are required or an adjustment in treatment.

♦ What is Hypocalcemia?

The condition of low blood calcium is called Hypocalcemia. Without the action of parathyroid hormone in our body there will be insufficient calcium to fuel the ‘electrical’ charge we need in order for our nervous system and muscle contractions to work properly. Sensing this our body will send out a low calcium warning signal and we develop symptoms of neuromuscular irritability such as tingling lips and fingers or muscle cramps.

Causes of Hypocalcemia symptoms

- An inadequate treatment regime
- Infections or other illnesses

- Changes in medications for other conditions
- Strenuous exercise
- Anxiety or stressful situations

♦ Symptoms of Hypocalcemia

While the symptoms of Hypocalcemia in some patients can be mild or asymptomatic, in others if the levels of calcium in the blood drop too fast or too far, or if the condition is inadequately treated there is a potential risk of it developing into a more serious condition which will require urgent medical treatment.

- Numbness or tingling of lips, fingers or feet.
- Muscle twitches or spasms
- Fatigue or weakness
- Irritability or mood changes
- Anxiety, stress or depression
- Foggy brain or inability to think clearly
- Dizziness or headaches

♦ Symptoms in severe Hypocalcemia

- Seizures
- Cardiac Arrhythmias
- Spasms of Larynx

♦ Long term symptoms may include

- Dental problems
- Dry skin
- Brittle nails
- Kidney stones or calcium deposits in the body
- Changes in mental health
- Memory loss or Dementia
- Cataract formation

If you experience any of these symptoms you should seek advice from your doctor.

This leaflet was prepared by Alice McGladdery in Northern Ireland for the Hypoparathyroidism Association Inc, with the acknowledged help and advice of Dr Simon Pearce, Consultant and Senior Lecturer, Clinical Endocrinology, Institute of Human Genetics, Newcastle upon Tyne, UK and medical board advisor to HPTH UK.

We would also like to acknowledge the help and advice in the final preparation, updated content and approval of the patient information leaflet content by the members of the Hypoparathyroidism Association Medical Advisory Board.

Website References: www.parathyroid.com
www.endotext.com
www.patient.co.uk

References: Various Hypoparathyroidism newsletters;
Walker, B.E., Payne.R.B. (1979) "Adjusted calcium conflict resolved? " *Journal of Clinical pathology (1979) 488-491*.

HPTH Association
P.O. Box 2258
Idaho Falls, ID 83403
USA

(866) 213-0394 (toll free)
Email: hpth@hpth.org
Website: www.hpth.org