

## The Most Frequently Asked Questions when Beginning Growth Hormone Therapy

### 1) What is Growth Hormone?

Growth hormone is a protein hormone secreted by the pituitary (master gland which promotes linear growth).

### 2) Is Growth Hormone a Steroid?

No. It is a natural protein hormone made up of amino acids.

### 3) Are there any side effects when using Growth Hormone?

Growth hormone does not have any significant side effects when used as a replacement therapy for growth hormone inadequacy or deficiency. It promotes linear growth. Children with hypopituitarism sometimes experience fasting hypoglycemia that is improved with treatment. Growth hormone results in reduction in body fat with increased muscle growth development. The recommended doses of growth hormone do not lead to problems, but long-term over-dosage, which is not prescribed by physicians, could result in signs and symptoms of acromegaly consistent with the known effects of excessive human growth hormone. This is not to be expected in growth hormone replacement therapy. Consult your physician or pharmaceutical company for further detail.

### 4) Why is growth hormone necessary?

Growth hormone is a natural hormone of the body that is necessary for normal linear growth. Growth hormone is therefore indicated for the long-term therapy of children who have growth failure due to inadequate growth hormone secretion.

### 5) How do you determine the dosage and will the dosage remain the same throughout therapy?

Growth Hormone is generally prescribed in a dosage of 0.3mg/kg/week. Higher doses may benefit some teenage growth hormone deficient patients, especially those who are most growth retarded at the start of puberty.

### 6) What changes, if any, should I expect to see in my child during therapy? (moodiness/hyperactivity etc.)

There should be no specific changes in your child's mood or activity on growth hormone therapy. However, since there is more attention and growth occurring, children generally will have an improvement in self-esteem, which may lead to other improved psychological aspects.

### 7) Literature has indicated injections at 3 times a week and intramuscular (into the muscle). Why are some children receiving growth hormone more frequently and subcutaneously (under the skin)?

Intramuscular administration of growth hormone has been the standard method. The initial synthetic product on the market, called Protropin by Genentech, was approved by the Federal Food and Drug Administration (FDA) for intramuscular use since it had been studied intramuscular. Subsequently, Eli Lilly developed Humatrope and studied it subcutaneously. This has been approved by the FDA. There has been a number of studies demonstrating subcutaneous is equal to intramuscular therapy. Growth Hormone is usually administered 6-7 days per week, but is also available in a long acting form, which is given every 7 to 28 days. There are currently 5 manufacturers approved for growth hormone manufacturing in the United States. They are Eli Lilly, Genentech, Novo Nordisk, Pharmacia, and Serono. Numerous other companies offer growth hormone in various countries throughout the world.

Daily injections or six days of each week are recommended when there are low blood sugars (hypoglycemia) or when there is not a persistence of expected "catch-up growth" measured as centimeters per year or inches per year. Growth prior to therapy is generally less than 4 or 5 cm per year and 8 to 10 cm per year during the first year of therapy. In the second and third year of therapy the rate may decrease to 7 cm per year. If the rate is insufficient, then changing from the three injections per week to the six or seven injections per week is indicated, even though the total weekly amount of growth hormone remains the same. It is then simply divided by a different number of days.

### 8) Should I worry when bubbles appear in the syringe that has been prepared for my child's injection?

A few bubbles may be of no consequence. One needs to practice to improve technique. Mixing and drawing require training and practice.

### 9) How long will my child be on growth hormone?

Growth Hormone is generally utilized for growth purpose until full growth has been attained with a bone maturation of 16 years or more for males and 14 years or more in females and the growth rate is less than 2cm/year.

Consult your physician for continuing growth hormone therapy if indicated under the guidelines for adult growth hormone deficiency. Growth Hormone Therapy is indicated in adults with Growth Hormone Deficiency and teenagers after full growth has been attained. Retesting with a Growth Hormone stimulation test is necessary and peak Growth Hormone values of less than 5mg/ml qualify for therapy. Adult Growth Hormone Deficiency patients may have impaired quality of life, reduced exercise capacity, high cholesterol, increased body fat with reduced muscle mass and reduced bone density.

10) Should my child give his own injections?

Children can share in the administration of their injections with supervision of their parents. Often children 8 years of age and older may decide to give their own injections. Sharing part of the injection technique may be important to their self-esteem.

11) What kind of growth should I expect to see in my child?

Generally, growth at the time prior to therapy is less than 4 to 5 cm per year. Growth may be between 8 to 12 cm per year following the initial year of growth hormone therapy. The second and third year may be closer to 7 cm per year. In other words, the growth is approximately 1 1/2 inches or less prior to therapy and may attain growth rates of 3-4 inches per year after initiation of therapy.

12) I left the growth hormone at room temperature for several hours. What shall I do?

Growth hormone is a protein hormone, which can be destroyed by heat or extreme temperatures, but there are some general recommendations to follow. Prior to reconstitution (mixing) of your growth hormone, a vial can be left out for 72 hours and then reconstituted with full effectiveness. Once a vial is reconstituted it could be left out inadvertently at normal temperatures up to 24 hours.

13) If my child prefers injections in the legs instead of the arms, is it okay in the legs only?

Rotation of injections is encouraged in the arms and legs; other areas may also be utilized when subcutaneous administration is used. Avoidance of the same spot or location is important to avoid local bumps in the skin called lipohypertrophy. This is a rare occurrence even when injections are administered in a similar location and is of no consequence.

14) Is it advisable to give the injection when my child is sleeping?

This is a frequently asked question that only parents can decide. Injections are generally preferred to be given at bedtime. Each child has an individual response or fear of injections. Younger children, when soundly asleep, appear not to respond to injections in the buttocks or leg area according to many parents.

15) I don't feel I can give the injections to my child. Is this a normal reaction?

This is a normal reaction of conscientious parents who have concern or fear of hurting their children. Children may express discomfort following an injection. Utilizing smaller needles and quicker subcutaneous injections are recommended. The child needs reassurance that the discomfort will diminish when they become used to the injections. The parent can reinforce the benefit of the injection in maintaining a positive attitude. Some people prefer to utilize an instrument such as Inject-Ease to administer the growth hormone.

16) What if I forget an injection?

One can generally make up the difference for missed injections by adding extra to other days. Remember that the total weekly dose remains the same.

17) What if my child wants to discontinue the injections, but there is a potential for more growth?

Children need to be encouraged to continue their therapy for full effectiveness. Only an individual family can make a final decision regarding which is best for their child. One needs to examine the child's motive for wanting to discontinue injections when they are really obtaining a definite and important benefit. The MAGIC Foundation has a free video available "Just Say YES To Growth Hormone" which can be ordered by calling 1- 800 - 3 MAGIC 3. This video is teens talking to teens about why they chose to stay on treatment.

18) What should I do if I run out of growth hormone?

It is generally recommended that you be aware of your growth hormone supply and call the source of supply, whether it be a pharmacy or home health care program prior to running out. Make sure that the prescription is still refillable and that the insurance company has continued the approval by having the physician send periodic reports. There is certainly no emergency if growth hormone injections are missed, but it is advisable to restart the injections as promptly as possible if you have run out.

19) How often will my child need to visit the endocrinologist and what additional tests need to be taken during the course of therapy?

The number of visits to the endocrinologist depend upon the age of the child and if there are any other conditions or hormone deficiencies such as hypopituitarism. The general recommendation is for visits to occur on the average of every three months or four times a year. Periodically, blood testing is necessary such as thyroid function studies and a bone age is recommended at least on a yearly basis. There is an increased incidence for the need of thyroid replacement as well, and indeed other deficiencies may be co-existing.

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