

HORMONES AND ME

INTRAUTERINE GROWTH RETARDATION (IUGR)





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About this Book

Intrauterine Growth Retardation (IUGR) should give you a basic understanding of the problems of children who are born small due to poor growth during the pregnancy.

The reader is encouraged to discuss any additional questions or areas of concern with the doctor after reading this booklet.

Serono Symposia Australasia is pleased to bring you **Intrauterine Growth Retardation (IUGR)**, which is part of their series of educational booklets titled "Hormones and Me". We hope that you will find it a valuable and helpful resource.

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Introduction

The term Intrauterine Growth Retardation (IUGR) represents a spectrum of conditions resulting from impaired growth of a baby in the womb before birth. Russell Silver Syndrome is only one of many different conditions causing IUGR (see Table 1). Although uncommon, Russell Silver Syndrome is discussed in some detail in this booklet because of the unique issues associated with it. As with any syndrome, not every affected child will have all of the features described.

The child who has IUGR, but has not experienced 'catch-up' growth during the first year of life, will be likely to remain small for his/her age and probably will be thin. There are many other features of IUGR

"IUGR represents a spectrum of conditions resulting from impaired growth of the baby in the womb before birth".

that may require medical care and support. It is important that you discuss any concerns that you have with your paediatrician who can then refer your child to another appropriate specialist if necessary.

We hope that this booklet will help you to understand more about your child's condition.



What is Intrauterine Growth Retardation?

Intrauterine Growth Retardation (IUGR) is defined as a baby born with a weight that is inappropriately low for the duration of the pregnancy. For a baby born at full term (40 weeks gestation) this is a birth weight less than 2.5 kg. There are charts that show the normal birth weight for premature babies (see Diagram 1). Low birth weight indicates that growth of the baby in the womb has been unsatisfactory. Ideally, infant length should also be measured but this needs to be done accurately, using the correct equipment, for a meaningful measurement.

The majority of babies born small for their gestational age show catch-up growth over the first two or three years of life. However, in about a third, complete catch-up growth does not occur. These children remain small and fail to reach their genetic potential as defined by their parental heights.

Table 1 gives some of the causes of IUGR. This booklet has a section dealing with Russell Silver Syndrome because these children have additional problems that do not affect the majority of children with IUGR. We have intentionally left out information on babies born small for gestational age,

“In about a third of children with IUGR catch-up growth does not occur.”

SOME CAUSES OF INTRAUTERINE GROWTH RETARDATION

- **Poor placental function**
- **Foetal problems:**
 - Infection during the pregnancy, e.g. rubella (German measles)
 - Chromosomal disorders, e.g. carrying an extra copy of one of the chromosomes
- **Syndromes:**
 - Russell Silver Syndrome
 - Other syndromes
- **Maternal problems:**
 - Hypertension (high blood pressure)
 - Chronic disease or malnutrition
 - Cigarette smoking
 - Alcohol abuse
 - Drug abuse



Table 1

who also suffer from other rare syndromes as well, because the problems are often more complex for those children. Parents seeking information about these conditions should get in touch with the Children's Growth Foundation, or the paediatrician who normally cares for their affected child. He or she will suggest the appropriate parents' support group.

Intrauterine Growth Curves

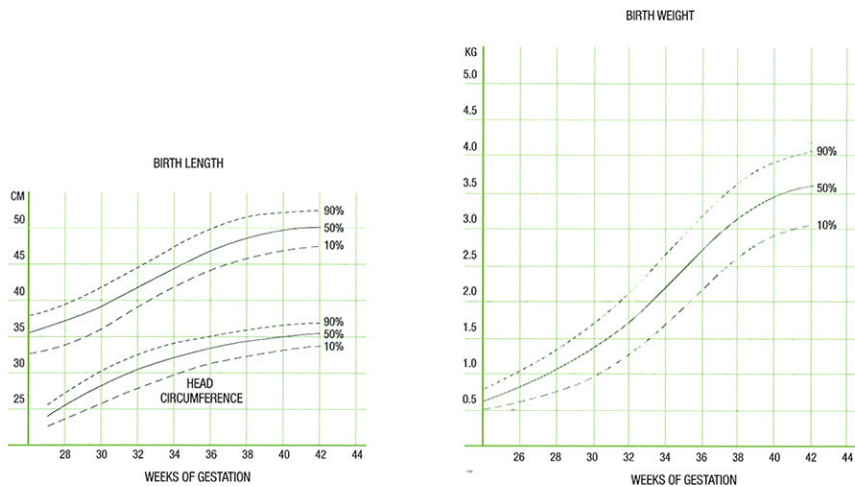


Diagram 1

Legend: Intrauterine Growth Curves² (Composite Male/Female): These charts show the range of birth weight, length and head circumference for babies of different gestation (duration of pregnancy). For each measurement there are three lines showing the 90th, 50th and 10th percentiles. For example, if your baby is on the 10th percentile for birth weight, this means that 10% of babies weigh less than your baby. Babies in the lowest 2.5% for birth weight and length are considered to have IUGR.

These curves have been adapted from:

² Kitchen WH, et al. Revised intrauterine growth curve for an Australian hospital population. *Aust. Paediatr. J.* 1983; 19: 157-161.



Russell Silver Syndrome

This condition was first described by Dr Russell in England and Dr Silver in the USA in 1953/54. At first it was thought that they were describing different syndromes but then it became clear that they had both seen aspects of the same condition. The syndrome is called Russell Silver in the UK and Silver Russell in the USA. Russell Silver Syndrome is very rare, occurring in 1/50,000 to 1/100,000 births. However, it is probable that there are many similar conditions that we describe collectively as Russell Silver Syndrome, and this may lead people to think it is more common.

Little is known about the cause of this condition and why some children with IUGR have specific features of the Russell Silver Syndrome while others do not. In the majority of families who have a child with this problem only one child is affected but very occasionally families do have more than one affected child. After a family has had a baby with Russell Silver Syndrome the risk for a second affected baby is low (about 5%). In the future, genetic research may shed light on possible underlying causes for this condition and may help to define the recurrence risk in particular families. A genetic basis for Russell Silver Syndrome is currently the subject of much research.

When chromosomes have been studied, it has been found that about 10% of children diagnosed with Russell Silver Syndrome have a condition called “maternal uniparental disomy” of chromosome 7. This means that both the child’s copies of chromosome 7 came from the mother (whereas under normal circumstances one copy comes from the mother and one from the father). There is no physical or intellectual difference that can be found between the children who have this pattern of inheritance and those who do not.

“Often it is not until after the first year of life that the characteristic features of Russell Silver Syndrome are recognised as being present”.

Families who have a child with Russell Silver Syndrome should be offered genetic counselling before they decide to have any more children, so they understand any risks for the future.

At present there is no special test which confirms the diagnosis of Russell Silver Syndrome for most affected children. So it is made on the basis of physical characteristics (see Table 2). These physical features are often not obvious until after the first year of life. When the child is examined, some of the following may be seen. **It is important to remember that your child is very unlikely to have all the features described.**

- A small triangular shaped face with a small jaw and a pointed chin. (the small jaw may subsequently lead to dental problems due to crowding of the teeth).
- A mouth which tends to curve down.
- The head circumference size is normal, but it often looks large compared to the small body size.
- The fontanelle (the opening between the bones in the skull), may be slow to close. (NB: This opening is under the skin at the top of the head and is there in all babies).
- The little finger of each hand may be slightly short and curve inwards (clinodactyly). This is one of the most frequent distinguishing features of Russell Silver Syndrome, but is not enough on its own to make the diagnosis.
- Body asymmetry: one side of the body can grow more slowly than the other and may therefore be smaller than the other. Sometimes the difference in length between the right and left legs may require a thick inner sole in the appropriate shoe. If the difference becomes more marked as the child grows, referral to an orthopaedic surgeon should be made. Your child’s growth will be monitored. Surgical lengthening of the shorter leg can be considered when your child is close to final height – if the difference between the length of the legs is severe enough to cause problems. Shortening of the longer limb is not recommended, as this will aggravate short stature.
- Hypospadias: Sometimes, in boys, the urethra (the tube through which urine is passed) may be short and so it may not open on the tip of the penis as it should. This can be overcome by surgery to extend the

urethra to its required length. It is important that your son should not be circumcised, as the foreskin may be needed for the surgical repair.

- Undescended Testes: In some boys the testes have not descended into the scrotum. The testes may need to be brought down into the scrotum with an operation. However, the testes may descend by themselves, given time. If surgery is needed, it is usually delayed until the age of 2 years.
- Delayed Gross Motor Development: Babies with Russell Silver Syndrome may be slower to learn how to hold up their heads and to develop a sense of balance, but they do learn. Their co-ordination may be slightly delayed, because of their smaller size.
- Prominent ears may be of concern. Plastic surgery can be used to correct this problem when the child is older, if it continues to be a problem.
- Ear infections are quite common. If they are persistent or happen frequently, your child may experience a decrease in the level of hearing. If you suspect any loss of hearing in your child, you should tell your doctor straightaway. Your child should be referred to an ear nose and throat specialist for further assessment. If a child's hearing is defective, this can result in delayed speech development. After the hearing problem has been remedied, it may be helpful for the child to attend a speech therapist, to catch up, and learn new words and speech patterns.
- If growth continues to be poor, with no "catch up" towards the normal range (on a growth chart), it is important for the child to be referred to a paediatrician for further assessment.
- Puberty may commence at a slightly earlier age than normally expected.

FEATURES OF RUSSELL SILVER SYNDROME³ (not all features are present in all cases)

Short stature from birth	99%
Triangular-shaped face	79%
Relatively large head size with prominent forehead	64%
Shortened and incurved 5th fingers (clinodactyly)	68%
Unequal leg and/or arm lengths (asymmetry)	51%
Turned-down mouth corners	46%
Delayed motor milestones	37%
Café au lait spots (scattered, pigmented skin spots)	19%
Early puberty	13%

Table 2

³ Wollman HA, et al. Growth & symptoms in Silver-Russell Syndrome: review on the basis of 386 patients. *Eur.J. Pediatr.* 1995; 154: 958-968



Growth

In this section the term IUGR is used to cover both low birthweight babies in general, and those with Russell Silver Syndrome, as their growth patterns share many features in common.

Two-thirds of children with Intrauterine Growth Retardation show catch-up growth by 2 - 3 years of age and then grow normally. However, the remaining one-third do not catch up to their expected height centile.

The likelihood of good catch-up growth is much greater if the Intrauterine Growth Retardation develops during the later stages of pregnancy.

In contrast, IUGR which occurs early in the pregnancy often results in minimal catch-up growth. Children with Russell Silver Syndrome usually fall into the group that does not show catch up growth.

Growth in the first year of life is mainly dependent on nutrition. Children with low birth weight may have insufficient intake of calories as a result of feeding difficulties (see later section) and this may contribute to their failure to catch-up.

Young children with IUGR often have a delayed 'bone age' which is determined by an X-ray of the hand and is an indicator of growth potential. A delayed bone age usually indicates the potential for some catch-up growth later on. However, in some IUGR children, and for reasons we do not understand, the bone age advances inappropriately during the middle childhood years. In such cases the child may not achieve his or her predicted final height.

Short stature is an ongoing problem for those children who do not "catch up" growth towards the normal range, during the early part of childhood. Some children with IUGR or Russell Silver Syndrome will also start puberty at an earlier age than average. A combination of early puberty and slow underlying growth rate may result in a small growth spurt during puberty. Final adult height may therefore be less than expected.

Growth Hormone Deficiency

Some research indicates that between 10% and 30% of children with low birth weight or Russell Silver Syndrome may have abnormalities of growth hormone secretion. In these children there may be a stronger indication for treatment with growth hormone. However the majority of children with IUGR do not have growth hormone deficiency.

The use of growth hormone increases growth rate in the short term – that is, over months to years. However, it is not clear that final adult height is improved by growth hormone treatment, when there is no true deficiency. This is different from treatment of other very short children who have a deficiency or absence of growth hormone. In those children, growth

hormone treatment makes a very big difference to both growth rate and adult height, because the deficiency is being replaced. For children with IUGR or Russell Silver Syndrome, however, it may be that children who are treated simply grow faster and finish growing earlier.

A large study¹ in this area found that there was no meaningful difference in final adult height, comparing children with IUGR who were treated with growth hormone and those who did not receive the treatment. However, further research is needed to finally answer the question as to whether growth hormone treatment can increase final height in children with IUGR.

“The majority of children with IUGR do not have growth hormone deficiency”.

If growth hormone treatment is to be considered for a child with IUGR or Russell Silver Syndrome, specialist advice should be sought from a paediatric endocrinologist. Tests of growth hormone production may need to be performed. Growth hormone can only be given as an injection, each evening at home. Parents are taught how to give injections. A child who has growth hormone treatment needs to be seen regularly by a specialist.

¹ Coutant R, Carel JC, Letrait M, et al. Short Stature associated with Intrauterine Growth Retardation: final height of untreated and growth hormone-treated children. *Journal of Clinical Endocrinology & Metabolism* 1998; 83:1070-1074.



Feeding

In the early months of life, children with IUGR tend to remain very thin and do not build up fat reserves. This may be due to feeding difficulties. This means that these children may be prone to episodes of hypoglycaemia (a lower than normal blood sugar level), particularly when they are ill. With some IUGR babies, the specialist will advise the family to try intensive feeding, through a nasogastric tube, to ensure that the baby is receiving enough calories. Although effective this naturally can be distressing for both the infant and the parents. Fortunately, this type of feeding is not usually needed for long periods and only some children need it at all.

Babies who are born with severe IUGR often find it difficult to breast feed as they do not suck easily and tire quickly. Sometimes bottle feeding may be the more successful option for mother and baby. However, many mothers have persevered and have successfully breast fed their child under difficult circumstances. You will need to decide which is easiest for you and your baby. It is very useful to seek the help of a nurse specialised in feeding difficulties, who may be able to assist with suggestions that enable breast feeding to be a success.

Increasing the calories in bottle feeds and frequent feeding of small amounts will encourage better overall intake with babies who have IUGR. However, if forced to have too much, even by well meaning professionals who are trying to encourage weight gain, these babies often gag and/or vomit it all up. If this happens, everybody is distressed, and the benefit of the whole feed is lost. The baby is exhausted, the mother upset and the feeding needs to start again. It is therefore better to persist with small, frequent feeds for best results.

Introduction of Solids

Children with IUGR can be very uninterested in feeding – and sometimes as they grow older, can show a real determination not to eat solid foods. This may be, in part because they associate the eating of solids with the unpleasantness of gagging, even on the tiniest lumps. If this happens, it can be helpful to continue using pureed food for longer than usual, and try and introduce solids again at a later date. Other ideas to increase the calorie value of food for your child include adding cream to drinks, breakfast cereal, custard etc. Consultation with a dietitian experienced in the care of babies and children is very helpful, to increase knowledge about high calorie foods and ideas, to vary tastes and encourage the child to learn about new foods.

Your child may start to take solid food slightly later than other children. You may notice that his/her diet is not very varied and that he/she seems to be very fussy in his/her eating habits, often having a distinct food preference. This may improve as the child gets older, but a pattern of eating very little for a few days followed by periods of increased appetite may continue until after the child has gone through puberty. Ask for help and

support from your child health nurse or GP as they may have ideas to help you overcome some of the feeding difficulties. A speech therapist with experience in feeding difficulties may be very helpful.

Hypoglycaemia

Hypoglycaemia means an abnormally low level of glucose (sugar) in the blood. Under normal circumstances, the body's stores of sugar in the liver are broken down and released during periods without food intake. This allows the body to maintain a normal blood sugar level. However, children with IUGR have relatively small stores of sugar and may have difficulty maintaining a normal blood sugar level when they go without food for an extended period.

The symptoms of hypoglycaemia include irritability, confusion, sleepiness, pale or grey skin colour, sweatiness and shakiness.

Many children with IUGR can become very irritable after physical activity, such as games or swimming, at the end of the school day, and/or on waking up. Because these children are thin, and do not have much fat under the skin, the level of sugar in the blood can fall very quickly. This can cause irritability. Giving your child a biscuit or a sugary drink will raise the blood sugar level and he/she should become better within 5 to 10 minutes, if hypoglycaemia has been the cause of the problem.

If your child has periods of inappropriate irritability/sleepiness or other symptoms of hypoglycaemia, it is important to let your specialist know.

Hypoglycaemia may be a problem over the first few months of life in babies with IUGR and Russell Silver Syndrome, and in the most extreme cases may require tube feeding, particularly overnight. This is usually done by using a small plastic tube which is inserted through the nose, down past the back of the throat, to the stomach. While the child's asleep, extra calories in the form of a liquid can be given this way.

In older children, the longest period without food is overnight when the child is asleep.

Hypoglycaemia is most likely to occur after a long period without food. The most likely time is therefore before breakfast in the morning. For an older child,

making sure that the child eats dinner and extra food before bedtime (eg chocolate biscuits or milk) helps to avoid this problem.

Maintaining a frequent calorie intake and avoiding prolonged periods without food, particularly during illnesses, are important things to remember. If food intake is reduced during illness, give your child frequent sweet drinks to lower the risk of hypoglycaemia.

If your child has suffered from hypoglycaemia it may be important that he/she has access to biscuits or snacks at school. If it is not your school's policy to allow this, your specialist or dietitian will be able to help by advising the school appropriately. After all, it is in the school's interest that

“If your child has periods of inappropriate irritability/sleepiness or other symptoms of hypoglycaemia, it is important to let your specialist know.”

your child is happy and alert during classes, so that he/she can concentrate and learn. It is also important that teachers are aware of the signs of hypoglycaemia in your child.

Fasting for Surgery

Particular care should be taken if your child requires an operation, as this may involve a prolonged period without food before, during and after the operation. Your doctor will advise what should be done. If your child is prone to hypoglycaemia he/she may need to have glucose given intravenously to cover the period of fasting before the operation and any period of reduced food intake after the operation.

If hypoglycaemia is, or has been, a problem for your child, it is helpful to read the booklet on “Management of Emergency or Stress Situations”.



School

Most children who are born with Intrauterine Growth Retardation are of normal intelligence and go through mainstream schooling. For those children who do have special educational needs, this mainly relates to difficulties with concentration, organisation and problem solving. If you feel that your child has a learning difficulty, you should discuss this with their teacher to see whether an assessment from an educational psychologist should be sought. This may identify the need for extra support within the school system.

Young children who are small for their age may have difficulties coping in surroundings designed for children who are taller and bigger. The height of chairs and desks may need an adjustment to allow a small child to see the board adequately, and to be comfortable for writing and desk activities. Also, they will want to be able to reach coat hooks and toilet locks without always asking for help. It is worth discussing these issues with the teacher before they become a problem for your child.

Clearly, a small child may resent being treated as younger than his/her years and as being less responsible than he/she is. However, it may be less clear that a child who is always treated as being younger than their years can fall

back and behave according to the age that their size indicates and not their true age. This can apply both educationally and emotionally. Behaviour difficulties may result from your child being treated as if younger than his/her true age.

Such children may start to achieve less than their true potential and may lose self-esteem if these issues are not addressed. Teachers need to be aware that a small child needs to be treated in an age appropriate manner, so that he/she may

develop confidence, self-esteem and independence. However, small stature may mean that some physical activities are not possible for the child's size. This situation needs to be handled with delicacy and encouragement.

"A small child may resent being treated as younger than his/her years and as being less responsible than he/she is."

Bullying

Although children may experience bullying at school, there are some who seem to be more vulnerable than others. Any child who says he/she is being bullied should be listened to very carefully. Talk to your child's teacher as every school should have a policy for dealing with bullying.

Physical Activity

The development of motor skills, such as co-ordination, may be slightly delayed, because of your child's smaller size and reduced muscle development, compared to children of the same age. Teachers need to be aware not to put such children in a situation where they can't physically cope.

This does not mean that they should be over protected, rather that they are helped to develop skills and not forced into activities that are outside their physical capabilities.

Sports and games are generally perfectly safe for a small child but there may be certain activities which are much more difficult for them and they should not be forced to participate. With the co-operation of your school you will, no doubt, identify activities that your child can take part in and do well at, such as swimming and gymnastics, rather than contact sports such as hockey, football or rugby. However, there are always some small thin children who excel at all types of sport, even seemingly unusual ones such as football or basketball. If your child with IUGR is good at sport, and happy to participate, there is no reason to prevent him or her joining in all normal activities.



Over Protection

Even though your child is physically small, taking responsibility and developing an appropriate

level of independence for age, should be supported. These skills are acquired over a period of time. They do not happen overnight. Your child will need your encouragement to achieve this. It is difficult for anyone to accept appropriate challenges if someone is always doing things for them. All children need understanding and encouragement to achieve their potential.

“Try to ensure your child is treated according to his/her age, not size.”



Questions and Answers

Q *Does appetite improve as children with IUGR get older?*

A Yes, but not completely. After puberty there is usually an improvement in appetite but it still remains far from normal for someone of the same age. These children usually remain thin.

Q *Can the diagnosis of Russell Silver Syndrome be confused with other conditions?*

A Yes. As there are very few signs and symptoms that are completely specific to Russell Silver Syndrome, it can be difficult to confirm the diagnosis. Unfortunately at the moment there is no blood test which confirms the diagnosis although this is being studied. So, the diagnosis needs to be made by an expert in this condition. This is usually an endocrinologist or a geneticist.

Q *Is the body asymmetry in Russell Silver Syndrome more often right- or left-sided and does it alter with age?*

A It is not known whether there is more right- or left-sided asymmetry, however it can appear that the left side is more often

smaller than the right. It is known that the difference remains unaltered both as the child gets older, and in adulthood.

Q *Does growth hormone treatment improve final height in children with IUGR or Russell Silver Syndrome?*

A This question has not yet been answered. Certainly, the dose that is used in children with growth hormone deficiency has very little effect. It seems that a dose about twice as high as the normal 'replacement' dose may be needed. In studies looking at these higher doses of growth hormone there has been a short-term improvement in growth rate but this does not guarantee an improvement in final adult height. Studies which go on for longer, that is until the children being treated reach their adult height, will be needed to see if the treatment helps them to be taller than they would have been without treatment.

Q *Is growth hormone therapy helpful in treating the body asymmetry?*

A No. Both sides of the body respond equally and so the asymmetry remains.

Q *Is special care required in children with Russell Silver Syndrome/IUGR if they are to have an operation and an anaesthetic?*

A Yes. It is important that the parents explain to the doctors and nurses that a long time without food (sugar) is very dangerous in children with Russell Silver Syndrome/IUGR. Great care should be taken if a prolonged period without food (fasting) is needed, such as before an

operation or special tests. These children are more likely to develop hypoglycaemia because they have very limited stores of sugar in the liver. If there is any concern, an intravenous glucose infusion (a drip) should be set up before the operation and should be continued during the operation as well as during the recovery period.

Regular checks should be made of the level of sugar in the blood. This can be done with a drop of blood obtained from a fingerprick.

Q *Do children with Russell Silver Syndrome/IUGR live to a normal old age?*

A This is a difficult question. There is evidence that having a very low birth weight can lead to an individual having an increased risk of high blood pressure and heart problems in later life. However, this is based on people who were born over 40 years ago and so whether it is true for children born today will not be known for a further 40-50 years.

Q *I have a child with Russell Silver Syndrome. What is the chance that it will recur if I have another child? What is the cause of Russell Silver Syndrome?*

A There is a small chance of having another affected child (approx. 5%). For most children, the exact cause of Russell Silver Syndrome is not known. In approximately 10%, a small genetic alteration in the chromosomes has been found (see page 8) but this does not change the outlook or appearance of affected children.



Further Reading

Australasian Paediatric Endocrine Group (APEG)
<http://www.racp.edu.au/apeg>

The Endocrine Society
<http://www.endo-society.org>

Lawson Wilkins Paediatric Endocrine Society (LWPES)
<http://www.lwpes.org/>

European Society for Paediatric Endocrinology (ESPE)
<http://espe.shef.ac.uk/>

Asia-Pacific Paediatric Endocrine Society (APPES)
<http://www.appes.org/>



Glossary

Body Asymmetry

One side of the body grows more slowly than the other, and is therefore smaller.

Bone age

Determined by an X-ray of the left hand and wrist, this is used as an indicator of how much time a child has before growth in height will stop. A 'delayed' bone age usually implies that growth will continue for longer than average and that there may be potential for catch-up growth.

Chromosome

A microscopic, thread-like structure that carries genetic information in the form of genes composed of DNA. Normally each human cell contains 23 pairs of chromosomes, and one pair of these are the sex chromosomes (X and Y). One of each pair normally comes from the mother and one from the father. Genes and chromosomes are the blueprints for the body's development, and so play a large part in determining a person's characteristics.

Clinodactyly

The little finger of the hand is short and curves inward.

Congenital

A feature or condition that is present from birth, but not necessarily hereditary.

DNA

Stands for Deoxyribonucleic acid and is the chemical that forms the genetic code.

Endocrine Gland

A gland that makes hormones and releases them into the blood.

Endocrinologist

A doctor who specialises in the disorders of the endocrine glands, including the evaluation of growth problems in children.

Foetus (fetus)

The developing baby in the womb from the ninth week of pregnancy until the moment of birth.

Fetal growth

Growth of the baby inside the womb.

Genetic potential height

The expected adult height calculated from the heights of the parents.

Geneticist

A doctor specialising in the diagnosis of inherited problems.

Gestation

The duration of pregnancy, recorded in completed weeks from the first day of the mother's last menstrual period (usually 37 to 40 weeks).

Growth hormone

A hormone released by the pituitary gland that promotes growth.

Hormones

Chemical messengers that stimulate growth and sexual development and help to regulate the body's metabolism. Normally the body carefully controls the release of hormones as too much or too little may disrupt the body's delicate balance. They are produced by endocrine glands and carry messages from one cell to another via the bloodstream.

Hypertension

High blood pressure.

Hypoglycaemia

A lower than normal blood sugar level.

Hypospadias

A condition in which the urethra is short and does not open on the tip of the penis, but on the shaft of the penis.

Intrauterine

Within the uterus (womb).

Intravenous

Given into a vein.

Orthopaedic Surgeon

A surgeon specialising in bone and joint problems.

Paediatrician

A doctor specialising in the treatment of children.

Paediatric Endocrinologist

A doctor who specialises in the disorders of the endocrine glands in children.

Pituitary gland

A pea-sized gland at the base of the brain that releases a number of important hormones, including growth hormone.

Placenta

The organ that connects the foetus to the wall of the uterus. The placenta provides the foetus with nourishment and eliminates waste.

Subcutaneous fat

A layer of fat normally present just under the skin.

Syndrome

A collection of physical and other characteristics that occur together and characterise a particular condition.

Testes

The male reproductive glands.

Urethra

The tube that takes urine from the bladder to outside of the body.



Organisations

Association of Genetic Support of
Australasia Inc.
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Telephone: 02-9211 1462

Children's Growth Foundation
PO Box 459
Maroubra NSW 2035
Australia
Telephone: 02-9315 7547

Growth Hormone Parent Support Group
432 Scoresby Road
Ferntree Gully VIC 3156
Australia
Telephone: 03-9764 0309

Parent and Family Resource Centre
PO Box 13185
Onehunga, Auckland
New Zealand
Telephone: 09-636 0351

Parent to Parent New Zealand Inc.
PO Box 234
Hamilton
New Zealand
Telephone: 07-834 1108

Russell Silver Support Group
PO Box 153
Coonamble NSW 2829
Australia
Telephone: 02-6822 1026



Serono Symposia Australasia are proud to bring you this booklet from their "Hormones and Me" educational booklet series. We aim to provide readers with a healthy understanding of the issues relating to endocrine disorders particularly in children. We hope that you find it a valuable and helpful resource.

Please ask your doctor or nurse for further information on the resources available to you.

We wish to express our gratitude to Serono Laboratories (UK) Inc for allowing the distribution of this booklet, which was reproduced in Australia in 2000. We would also like to especially thank the Paediatric and Adult Endocrinologists who gave their time and experience to review and edit the booklets for Australian and New Zealand readers. Special thanks to all those involved in this process.

The views expressed in the "Hormones and Me" booklet series are not necessarily Serono Symposia Australasia's, but those of the qualified clinicians working in the field of paediatric and adult endocrinology.



HORMONES AND ME

INTRAUTERINE GROWTH RETARDATION (IUGR)

THIS BOOKLET IS ESSENTIAL READING
FOR THE FAMILIES OF CHILDREN WHO
HAVE BEEN DIAGNOSED WITH
INTRAUTERINE GROWTH RETARDATION.
IT IS ALSO RECOMMENDED READING
FOR THEIR FRIENDS, TEACHERS AND
ANYONE WHO INTERACTS WITH THESE
CHILDREN REGULARLY.