



We Want A Baby

A Matter of
Body and Soul





We Want A Baby: A Matter of Body and Soul



Saying "yes" to a child is a clear expression of profound affection and trust between two human beings. Saying "yes" also means that both of you accept the responsibility of a new human being who is part of you both.

If the desire to have a baby is unfulfilled, this can easily lead to stress on the relationship because a common goal in life appears to be in question. Often enough the subject of infertility has been made a taboo. The problem hangs in space without being discussed. Silence also means bearing the burden alone; a burden that can come from unwanted childlessness. It often goes on for years before the couple bring their problem to their private practitioner, gynaecologist/obstetrician or to a fertility specialist.

So, it's the right step to seek professional guidance at our clinic/practice. We'd like to thank you for the trust you are placing in us by taking this step. You can be sure that our team of physicians, biologists, psychologists, laboratory technicians and assistants will exhaust all possibilities to help you.

At this point we must also say that, despite all of the progress made in medicine, we cannot guarantee a successful outcome for the treat-

ment. A human being is no mere mechanical collection of gears but a complex interaction of body and soul.

This brochure you have in your hand is the start to the treatment. It is important that you be fully informed and educated before you make the decision to go ahead with treatment. We shall be pleased to meet with you personally to advise you further so that all open questions will be answered.

You and your partner must read this brochure so that you both have the same level of understanding. When reading, please note everything that you don't understand on the pages at the end of the brochure that are provided for this purpose. We'll be happy to cover all of it in our discussions.

To make this brochure easier to read, we have used masculine pronouns when referring to doctors, psychologists and other persons. Naturally, our statements also refer to woman. We would like to thank you in advance for your understanding.

Sincerely,
Your "We Want A Baby" Team

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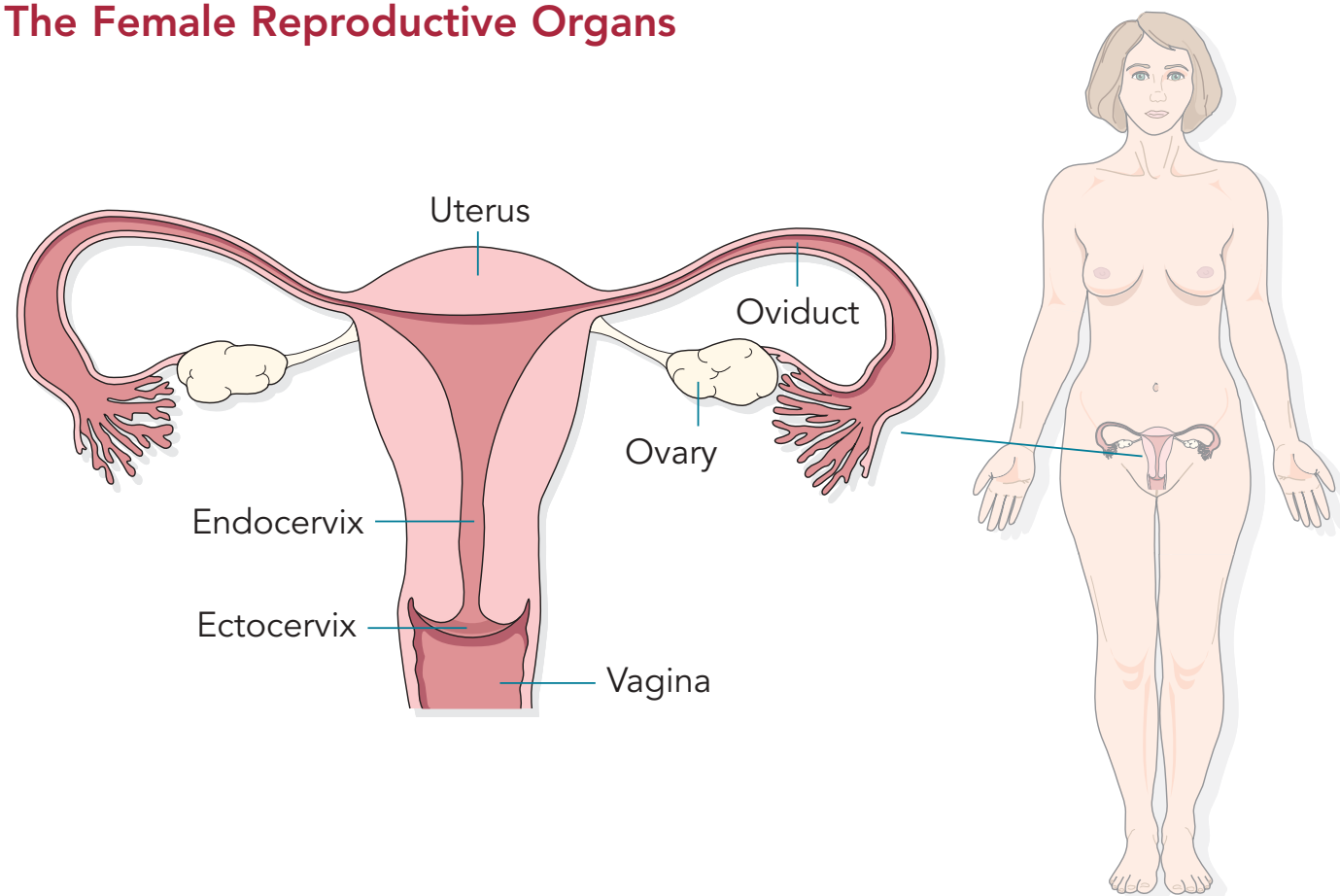
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The Female Reproductive Organs



One of the most exciting chapters in nature is human reproduction. Procreation and pregnancy are the product of a brilliant system, in which our soul and our bodily functions must be in complete harmony with each other in a narrow space of time.

In order for reproduction to be possible at all, various processes in the bodies of the man and the woman must be co-ordinated and regulated. The hormones* play a central role in the process. Hormones are messenger substances that are similar to a postman: they deliver messages and instructions to different recipients. The hormone senders are the glands distributed throughout the body, whose messages trigger certain reactions in the recipient – that is the organs.

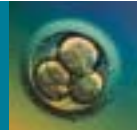
The Female Cycle – A Hormonal Regulatory Circuit

The female cycle is a periodically recurring process which creates the requirements for reproduction in the female. Initially, maturation of an egg cell capable of being fertilised is in the foreground. Very closely connected with this is the alteration in the uterine mucus membranes*, which prepares the uterus for receiving a fertilised egg. Hormones act as regulators to ensure that both processes take place in proper sequence. The cycle starts when certain glands in the brain (the sender) send hormones into the blood, and those hormones then cause an egg to mature in the ovaries* (the recipient) and ovulation* to occur.

For a better understanding, it must be said that the usual names of the hormones are found only as abbreviations. The actual concepts come from medicine and generally indicate (in Latin or Greek) what the hormone does.

* The explanation of the technical terms marked with an * can be found in the chapter Technical Terms – Quick Guide on page 35.

The brain controls the female cycle with the help of hormones



As in all biological rhythms in our bodies, the brain is the supreme control centre in the reproductive processes as well. This is understandable when one realizes that all external and internal stimuli are collected in our brain and processed there. Even control of our emotions and feelings like love, excitement and lust are the brain's work.

At the very beginning there is the hormone GnRH (gonadotropin releasing hormone*, also known as releasing hormone). It is secreted in the brain and brings about the release of the fertility hormone FSH (follicle stimulating hormone)* and LH (luteinizing hormone)* in another area of the brain. Both hormones act on the ovaries through the blood. Keeping to a specific sequence in releasing the hormones is important because the prerequisites for a successful pregnancy are created only in this controlled system.

The Steps to Pregnancy

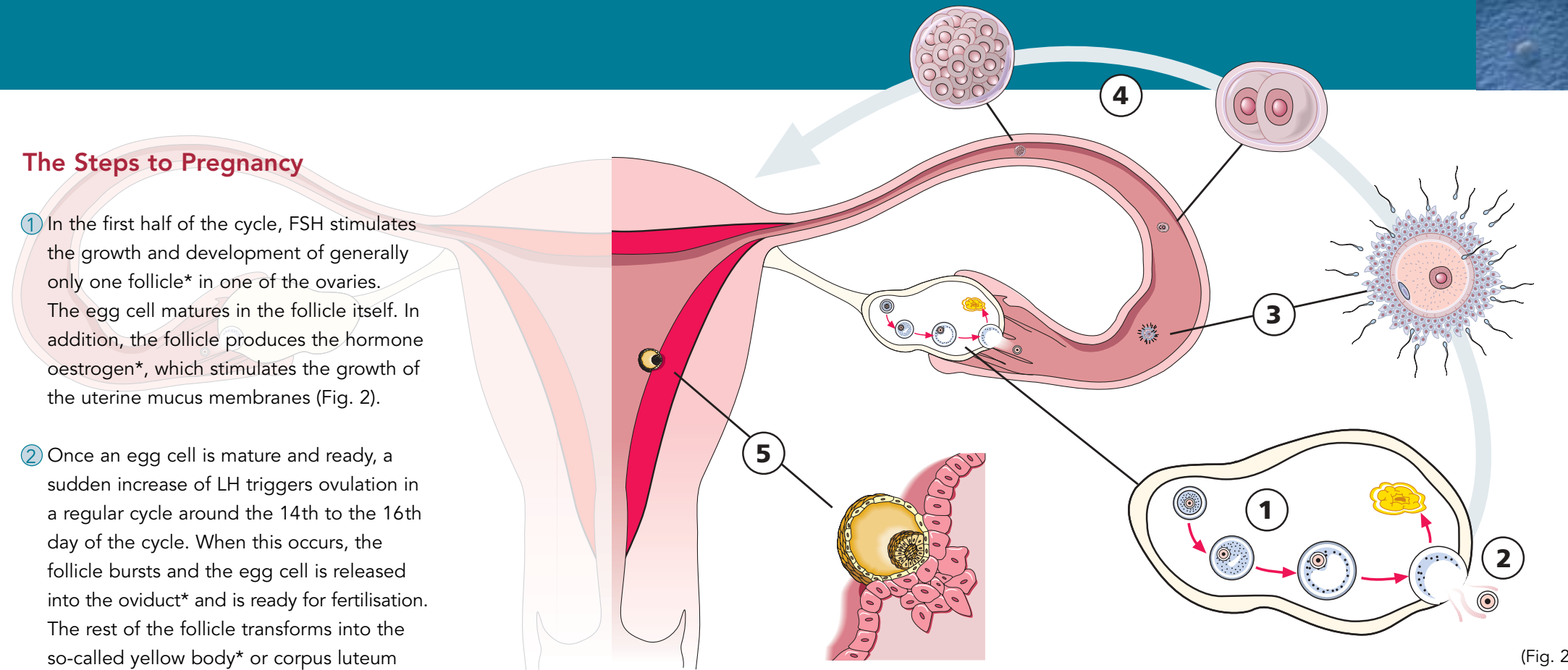
- ① In the first half of the cycle, FSH stimulates the growth and development of generally only one follicle* in one of the ovaries. The egg cell matures in the follicle itself. In addition, the follicle produces the hormone oestrogen*, which stimulates the growth of the uterine mucus membranes (Fig. 2).
- ② Once an egg cell is mature and ready, a sudden increase of LH triggers ovulation in a regular cycle around the 14th to the 16th day of the cycle. When this occurs, the follicle bursts and the egg cell is released into the oviduct* and is ready for fertilisation. The rest of the follicle transforms into the so-called yellow body* or corpus luteum which also sends out a hormone, progesterone*. Progesterone prepares the uterus for possible pregnancy.
- ③ The egg cell wanders through the oviduct towards the uterus and is fertilised in the oviduct. Of all of the semen cells (sperm)* that make it to this point, only one of them is successful in getting through the protective covering of the egg cell. The father's

genetic material and the mother's then mix with each other – and a new life is created. This is called an embryo*.

- ④ In the course of the first cell divisions, the embryo migrates to the uterus*. Shortly

before it implants there, it must slip out of the egg envelope.

- ⑤ The actual implantation in the nutrient-rich mucus membranes of the uterus does not occur until at least the 6th day after fertilisation.



(Fig. 2)



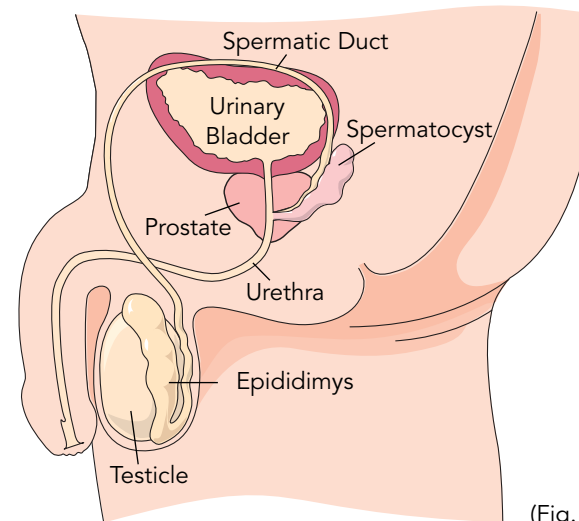
Even the embryo and later the placenta* release hormones that work primarily to maintain the pregnancy. If there is no fertilisation or if the embryo cannot implant itself, the uterine mucus membranes are expelled as the monthly period. The cycle then begins again.

Hormones are released by the follicle, the embryo and the placenta

Although the hormones are well-co-ordinated with each other – like a relay race – a successful pregnancy is not a given. The pregnancy rate per monthly cycle is only 20–30% with regular, unprotected sexual intercourse. There are many reasons for the "low" success rate. For example, the maturation of the egg cell or the interplay of the hormones may be disturbed. Frequently, cell division in the embryo goes awry so that the embryo cannot implant in the mucus membranes of the uterus.

Semen Cell Maturation in the Male

Just as in the woman, the hormones play a primary role in co-ordinating and regulating procreation in the man. Here too, the supreme controller is the brain, which releases the sex hormones FSH and LH into the blood into the blood in response to the releasing hormone, GnRH. Both hormones regulate the processes in the testicles. FSH, for example, is essentially involved in the formation of sperm cells. The sperm cells develop in their millions each day in the so-called spermatogenic canal or seminiferous tubules. From there they reach the nearby storage sites (epididymis)*, where they finally mature (Fig. 3).

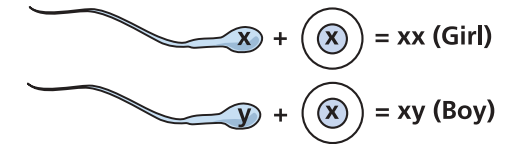


(Fig. 3)

With ejaculation and the muscular contractions, the sperm are pressed through the spermatogenic ducts and the urethra and ejected out.

Each ejaculation contains 300 – 400 million sperm cells. This enormous number is necessary because only a few hundred actually reach the egg cell in the oviduct.

The sperm cell consists of a head, a middle portion and a tail. The paternal genetic material is found in the head of the sperm; upon fertilisation, it is that genetic material that determines whether the child will be a girl or a boy (Fig. 4).



(Fig. 4)

The middle portion is a kind of battery for providing the sperm cell with the energy it needs to move. The "motor" is the tail piece of the sperm cell. The sperm is moved forward by a whip-like back and forth movement of the tail. (Fig. 5).



(Fig. 5)

Unfulfilled Desire for a Baby – Not a Question of Guilt or of Failure

An unfulfilled wish for a child is by no means only a woman's issue. Today, medicine is aware that in 30–40% of the cases the causes are equally distributed between the man and the woman. In about 15–30% of couples the problem is in both partners. In only 5-10% of couples can no organic cause be found. So, as a rule, infertility concerns both partners. In this respect it is understandable that the decision to seek treatment must be made mutually.

The causes of infertility are distributed equally between the man and the woman.

When Do We Start Talking About Infertility?

Medical doctors refer to infertility (sterility)* when over a one year period of regular sexual intercourse no pregnancy occurs. In the majority of cases, there is no complete sterility but only a malfunction that can possibly be treated by a physician.

Psychological Causes – Can the Mind Say „No“?

When no physical causes can be found for childlessness, a psychological stress reaction is often sought as the underlying cause. Although there is no scientific evidence for this, in very extreme situations psychological stress can be so overwhelming that the body "refuses" pregnancy. The experience of not becoming pregnant, although everything possible has been done, very often results in frustration.

Even a feeling of failure and self-recriminations begin. In addition, the infertility is often, in ignorance, blamed on the woman, who then feels abandoned to her personal "guilt". This negative attitude and the increasing pressure of expectations pave the way for permanent stress and inner turmoil.

The unfulfilled wish for children and the fruitless relentlessness of waiting can also leave its mark on the man. The pressure that despite all intent no baby is produced can also result in feelings of self-doubt. The occurrence of recurring questions and thoughts, which become a vicious circle, must be understood to be a normal reaction in this situation.

Escape from this vicious cycle of depression and failure in fertility or procreation is only possible when the partners discuss matters or seek the help of a physician or a psychologist. When doing this, the goal is to become more familiar with, to understand and to learn to respect the attitude and feelings of your partner. If the willingness is there, all anxieties and sensitivities that are gnawing at the soul should be addressed without associating it with an indictment of the other. Many couples report that their sexual relations changed once they began intensively trying to achieve pregnancy. Often the lust becomes frustration.

In order to be able to discuss your mutual and individual attitude regarding the problem of childlessness on a more objective level, answering several questions may clarify your hopes and expectations regarding a baby :

1. Why do we actually want a baby at this time?
2. What does a baby mean to our relationship?
3. What has changed in our relationship, since it hasn't "worked"?
4. How do we experience our sexuality?
5. What would life be like for us without a baby?
6. How do we feel about adoption?

The discussion of questions that concern the world of the emotions is a quite normal part of the conversation with your doctor. In addition, a psychologist is available at our clinic/ practice to work with you to understand what's going on inside.

In addition, you can contact the "Wunschkind e. V." association (address on page 32) which will also be pleased to provide you with assistance.

Discussing a problem with others often helps in finding the solution



Physical Causes



In the majority of cases, infertility doesn't have a hereditary cause, but an acquired one. While in 1970, for example, approximately 90% of men and women were under 30 years old when their first child was born, today more than a quarter of the couples are over 30 years old. Already as of 30 and even more so after 35 and 40, fertility in the woman declines and approximately as of 40 semen production and quality gradually diminish in the man.

Male Infertility

The most frequent fertility problem in men is deficient production of normal and mobile sperm.

There can be many reasons for this condition:

- mumps infection in childhood
- varicose veins in the testicles
- undescended testicles
- hormonal disorders
- diabetes
- tumour surgery
- genetic disorders
- stress
- infections
- environmental pollution
- heavy nicotine and / or alcohol use

Very often, however, the causes cannot be clearly determined.

Another, albeit rare cause, is in impaired sperm transport. In this case, sufficient sperm is produced, but they cannot reach the woman's body because the sperm ducts are blocked. In the majority of cases, the cause is underdeveloped or obstructed ducts in the epididymis or prior sterilisation*.

In men, the cause of infertility is frequently low numbers of sperm or poor sperm quality

Female Infertility

Disorders of Egg Maturation

Disorders of egg cell maturation are a common cause of infertility in the woman. The cause of the disorder is generally a hormonal dysfunction in the ovaries. If there is a hormonal imbalance, not only egg cell maturation but also even ovulation or formation of the yellow body can be adversely affected.

Hormonal imbalance can impair egg cell maturation

Infertility Due to Disorders of the Oviduct

The oviducts are the "conveyor belts" for the sperm cells to the egg and for the fertilised egg to the uterus. If the oviducts are obstructed or otherwise closed, transport of the egg can be made difficult or even impossible.

Total blockage of the oviduct can be caused by inflammation, previous tubal pregnancies*, operations or by spontaneous proliferation of uterine tissue outside of the uterus (endometriosis)*.

Endometriosis

Endometriosis means proliferation of uterine mucosal tissue outside of the uterus. These growths can affect not only the urinary bladder, intestine and abdomen but also the reproductive organs such as the oviducts and the ovaries so that conception becomes difficult. The cause of endometriosis is generally unknown.

Alterations in the Uterus and the Cervix

The cervix is the narrowest point, similar to a bottle neck, through which the sperm must pass on the way to the egg cell. Scarring (operations), blockages or inflammation can prevent reproduction. Even muscle nodes (myomas)* in the uterus are frequent causes of long infertility or miscarriages.

Malformations of the Ovaries, Oviducts or the Uterus

In very rare cases – as a rule congenital – malformations in the reproductive organs are the cause of failure to conceive.

Polycystic Ovary (PCO)

Infertility in the woman can frequently be triggered by the occurrence of numerous small cysts (fluid-filled bubbles) in the

ovaries (polycystic ovary)*. This disorder is frequently associated with elevated levels of male hormones.

Disorders of the Immune System

Also very rarely, a perturbation of the immune response is the cause of infertility in the woman. In this disorder, one's own immune system recognises the egg cell or the semen cells as foreign bodies and combats them as if they were "trespassers".

Consulting Your Doctor

Before deciding which treatment course is to be taken, the causes of the infertility must first be investigated using medical techniques. In our clinic/practice an in-depth discussion is always the start of the diagnosis. At that opportunity, we attempt to form an idea of the background of the inability to produce a child.

Important key questions include:

- How long have you wanted to have a baby?
- Have you ever before been under a doctor's care?
- Do you have your own explanation for your inability to have a child?
- How are you dealing with your infertility?
- How has your life changed since infertility (your relationship, your job, your self-esteem)?

- How do you feel about the alternatives (adoption, foster child)?

The background of the inability to produce a child is the starting point of the diagnosis

It is frequently necessary to ask questions concerning the couple's intimate relations. We understand very well that it is unusual or embarrassing when you have to talk about your sexual practices. This information does help us, though, if we want to discover the cause of the infertility. Please always accept that we will treat your statements confidentially.

It is important to us that you ask questions that are important to you. If you feel you have not understood something, we want you to ask again. Moreover, we recommend that, before the first discussion, you put together a list of questions that concern you most. Furthermore, it is very helpful if you bring along all results of any previous examinations and, if applicable, surgical reports.

Physical Examinations

Diagnosing a fertility disorder requires a special, methodical procedure that takes time. Since very frequently both partners are affected, both the man and the woman are examined.

In infertility, both partners are always examined

Examination Methods in the Man

Examination by Palpation and Ultrasound Examination

If the man has consulted a urologist or an andrologist, the first step is to perform a tactile examination. This involves examination for signs in the testicles and in the epididymis. The prostate* is palpated via the rectum. Frequently, to assure nothing is missed, the testicles and prostate are examined using ultrasound.

Semen Examination

Male reproductive capacity can be determined by microscopic examination of the semen. Semen cells obtained by masturbation are

examined under the microscope for normal shape and good motility. Since the sperm quality can vary quite a bit, the examination will be repeated at least twice in the space of one month.

Rarely, a tissue sample is required from the testicles in order to determine if there is a problem in sperm cell production.

Determination of Hormone Levels

Drastically low sperm production can be caused by a disturbance of the hormonal balance. Using a determination of hormone levels in the blood, such a disorder can be excluded. Hormonal disorders in the man are substantially rarer than in the woman.

Genetic Testing

Another possible examination in the case of excessively low sperm count is testing for a genetic cause. This can be done by using a simple blood test that is done in a laboratory.

Examination Methods in the Woman

Examination by Palpation

In the gynaecological examination, an examination by palpation will initially determine whether there are any signs in the sex organs or other physical changes that may be the cause of the infertility.

Ultrasound Examination

In the next step, the reproductive organs will be more closely examined using an ultrasound device. This painless and safe examination is done via the vagina, since the physician can approach the ovaries, the oviducts and the uterus more closely by this route.

Determination of Hormone Levels

In order to exclude a disorder of egg cell maturation, the levels of various hormones in the blood will be tested on certain days in the monthly cycle. This primarily includes the following hormones at the start of the cycle: oestrogen, LH, FSH, androgens*, prolactin, TSH (a hormone produced by the thyroid gland)*. In the second half of the cycle, progesterone and oestrogen values may be measured.

Examination of the Oviducts

If there is suspicion of injury to the oviducts, imaging or surgical examination methods may be used. In the imaging methods, the function and condition of the uterine cavity and the oviducts will be determined using x-ray pictures or ultrasound. Contrast media must be used in both methods to assure that the images are very clear. (Fig. 6)



An oviduct filled with contrast medium.

(Fig. 6)

The examinations are done without using anaesthesia and on an outpatient* basis. Performance of laparoscopy is preferred for better interpretation.

Laparoscopy

Laparoscopy is performed under anaesthesia. Initially, a tubelike instrument (laparoscope) is introduced into the abdomen through a very small incision made just under the belly button. This instrument is connected by a camera to a monitor so that a very precise image can be made of the reproductive organs. Using the laparoscope, if required, cysts, growths or sites of endometriosis can be surgically removed. Possible complications associated with this procedure are very rare. Primarily, they involve injury to internal organs or infection. Also rare are problems that can occur in conjunction

with the anaesthesia. If we have to perform this procedure on you, we will explain to you the possible risks in great detail.

Hysteroscopy

To determine malformations, interfering muscle nodes (myomas) or mucosal changes in the uterine cavity, a very fine probe will be introduced through the vagina into the uterus. Using this method, the physician can very closely examine the uterine cavity and the outlets of the oviducts using a camera that is connected to the probe or, if necessary, even perform surgery.

As helpful as today's treatment of infertility is, it requires a lot of time and some patience and perseverance. Above all, the emotional ups and downs between anxiety and hope can be very stressful. Along with every hope you must also be willing to accept the fact that the therapy may not work.

In order to lessen the disappointment, you should both give some thought to alternatives in life planning (adoption, for example). For instance, adoption or taking on a foster child may be a possibility for becoming parents. If the desire to give a child love and care is paramount, the thought quickly perishes that the adoptive child is genetically unrelated. Even biological parents become real parents only when they care for their child and give it a great deal of attention.

Before you decide in favour of treatment, you should feel that you have been well-informed and educated. Along with the physician consultation, we feel it is recommendable that you contact a self-help group, for example, before deciding on treatment. They will be able to provide you not only with information but also support for possible concerns and fears.

Prior to treatment there is always intense education

Treatment Opportunities

Medical treatment of infertility can go in very different directions, depending on the cause and requirements.



Overview of our Assistance

Which Method?	For which Disorder?
Hormone therapy with medication	<ul style="list-style-type: none"> • Hormonal imbalance • Disorder of egg cell maturation or ovulation • Disorder of hormonal testicular function
Artificial Semen Transfer (Intrauterine Insemination – IUI)	<ul style="list-style-type: none"> • Marginal semen quality • Immune reaction against semen cells • Disorder of the cervix
Fertilisation outside of the body (IVF = in vitro fertilisation)	<ul style="list-style-type: none"> • Functional disorder of the oviducts • Marginal semen quality • Endometriosis • Infertility of undetermined origin
Injection of a semen cell into an egg cell (ICSI)* and subsequent transfer of the embryo to the uterus	<ul style="list-style-type: none"> • Very questionable semen quality
Surgical collection of sperm from the testicles or the epididymis (TESE / MESA)*	<ul style="list-style-type: none"> • Functional disorder of the sperm ducts or the testicles • No semen cells in the ejaculate

Hormonal Therapy for the Man

Fertility can be affected by hormonal disorders in the man as well. It is, however, only rarely possible to eliminate these by hormone therapy. For example, diminished functioning of the testicles that is triggered by a deficiency of LH and FSH, can be treated externally by administration of hormones. Several other disorders of hormonal balance that impair reproductive capacity cannot be treated using medicines.

Hormonal Therapy for the Woman

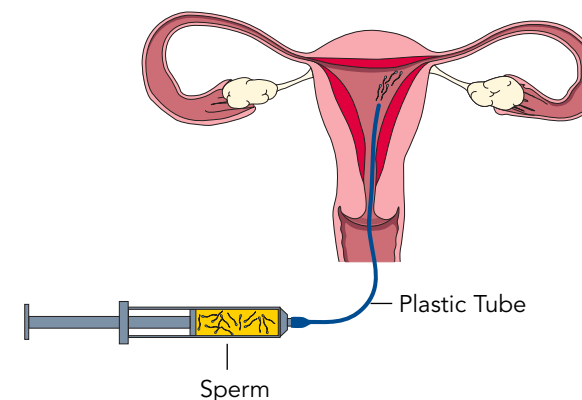
If the cause of the inability to conceive lies in a hormonal disorder in the woman (for example, malfunction of the thyroid gland or over-secretion of male hormones), medicines with specific modes of action can be used. If, despite normal levels of hormones, the function of the ovaries is inadequate, clomiphene tablets or injections of FSH (egg cell maturation hormone) and, if appropriate, LH (ovulation hormone) can stimulate the natural cycle.

The goal of hormone therapy is stimulation of egg cell maturation or ovulation. By concomitant intensive medical monitoring, the optimal point in time for sexual intercourse (as close as possible to ovulation) can be determined, at which ovulation will most probably occur.

The goal of hormone therapy is stimulation of egg cell maturation

Artificial Semen Transfer (Intrauterine Insemination – IUI)*

This procedure is particularly appropriate when insufficient or mainly poorly motile semen cells are present. In this case, egg cell maturation is first promoted by administering fertility hormones. The semen is collected by masturbation and qualitatively processed in the laboratory. With the aid of a flexible thin plastic tube, the semen is then introduced into the uterine cavity, as close as possible to the egg (Fig. 7).

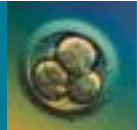


(Fig. 7)

The advantage of this method is that very many semen cells are able to approach very closely to the egg cell. Another, method – though rarely practised today – is introducing the semen directly at the mouth of the uterus by using a plastic cap.

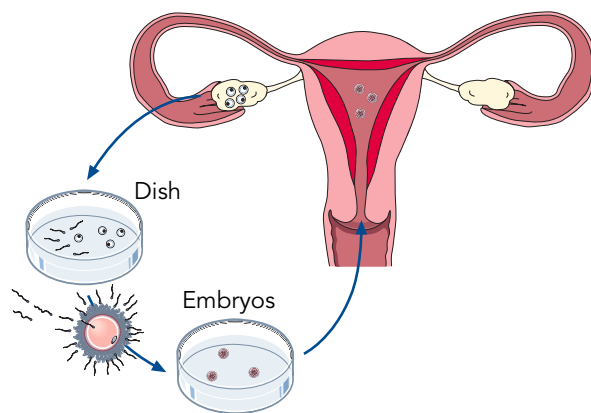
Fertilisation Outside of the Body (IVF = in vitro fertilisation)

Fertilisation outside of the body can be achieved using different procedures. Basically, it is begun by stimulating egg cell maturation by administering fertility hormones. The difference from conventional stimulation is that by administering hormones, several egg cells can be



matured and harvested so that they can be fertilised outside of the body (Fig. 8). In order to be able to collect as many mature egg cells as possible, the hormonal stimulation must be appropriately adapted.

After fertilisation, the embryos (maximum of three) are inserted into the uterus. As a rule, in women under 35, a maximum of two embryos are inserted.



(Fig. 8)

What Prerequisites Exist for IVF Treatment?

- The first prerequisite for medical treatment is that the inability to conceive cannot be eliminated by any other method.
- As a rule, only egg and semen cells from the married couple are used.
- The law requires – for both partners – an HIV test (blood test to exclude HIV infection)*.
- Testing for infectious hepatitis.
- The partners must, as a rule, be married.

Special Requirements for the Man

- The most important requirement for the man is the evidence that sperm are being produced that are of a particular quality.
- In certain treatment methods, a family history analysis and/or genetic testing is recommended.

Special Requirements for the Woman

- If at all possible, the woman must be less than 40 years old.
- Because measles during pregnancy can harm the child, protection against measles is required.
- At least one oviduct and the uterus must be functional.

Other conditions for artificial fertilisation are set forth in the Embryo Protection Law (see page 31).

IVF treatment can be divided into different treatment phases:

The Preparation Phase

The first step in treatment is used to optimally prepare the body for hormonal stimulation. As a rule, the woman's cycle is initially adjusted so that the time point of ovulation and harvesting of the egg cell can be well controlled externally. This is achieved by administration of medications that suppress the body's own production of the fertility hormones (known as down-regulation)*.

When this is done, the stimulation phase is more easily controlled. The medications administered in this phase (GnRH antagonists)* act on the part of the brain that releases fertility hormones.

The Stimulation Phase

Nowadays, GnRH antagonists are available for suppression of the body's own hormonal production. GnRH antagonists have the advantage that they are not used until the stimulation phase. The total treatment time is thus shortened, and the occurrence of any hormonal withdrawal phenomena is eliminated.

Stimulation of the ovaries aims at bringing several egg cells to maturity at the same time. This is necessary because not every egg cell is fertilised and not every embryo implants in the uterus.

Hormonal stimulation is very closely monitored by ultrasound examinations and testing of hormone levels in the blood. This regular monitoring serves to observe the number and size of the follicles and the thickness of the uterine mucus membranes. Only in this way can the most favourable time for triggering ovulation and egg cell harvest be determined.



Furthermore, monitoring can reduce the risk of massive over-stimulation. Various medications that correspond to the natural regulatory cycles of the hormones can be used for stimulating egg cell maturation. Generally, fertility hormones that are obtained in a variety of ways are given.

Other medications (clomiphene tablets) stimulate the brain to secrete more of the fertility hormones.

HMG (human menopause gonadotropin)* is obtained from the urine of women going through menopause. HMG products contain approximately equal concentrations of FSH and LH.

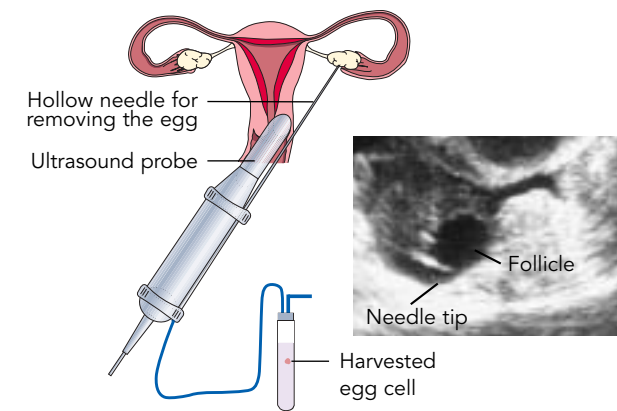
LH (luteinizing hormone) as a pure substance is now produced using biotechnology. LH is also administered to women who exhibit an LH deficiency. With the first pure, biologically engineered LH an individual combination of FSH plus LH can be selected. But since most women can produce enough LH on their own, FSH is usually given alone.

FSH can be manufactured in a variety of ways. FSH, like HMG, can be extracted from the urine of women going through menopause or it can be produced by biological engineering methods. Because the purity and FSH concentration can vary widely in the urinary preparations, treatment using the bioengineered FSH is preferred. The hormones produced by this latter method are highly pure and often better tolerated.

Treatment with gonadotropins (FSH) generally starts 14 days after down-regulation or in the first three days of the cycle (1st cycle day = 1st flow day). The treatment lasts about 11–13 days. During this time, a specific amount of the hormone is injected under the skin every day, preferably at around the same time of day. If a GnRH antagonist is used for suppressing the body's own hormone production, this is administered starting on the 5th–7th stimulation day. When using bioengineered preparations, little local intolerance at the injection site can be expected. Therefore, you can administer the injections yourself at home or ask your partner for help.

Ovulation and Harvesting Egg Cells

If the egg cells are ripe and matured in the follicles, the fertility hormones are suspended. Using the hormone hCG (human chorionic gonadotropin) the egg is now prepared for ovulation. HCG can take over the role of LH in the natural cycle. After approximately 36 hours, the eggs are harvested (follicular puncture) from the follicles shortly before ovulation using a long needle (Fig. 9).



(Fig. 9)

HCG (chorionic gonadotropin) is extracted either from the urine of pregnant women or it can now be produced purely by bioengineering methods.

Early extraction is necessary because the egg cell, after ovulation, will disappear in the oviduct and be lost. The ultrasound-controlled procedure is done via the vagina. To make this a bit easier, you will be given a pain killer or sedative or even anaesthesia. After the extraction is completed, you may experience slight pain and minor bleeding.

In rare cases, harvesting the egg cells must be done by laparoscopy.

Fertilisation

On that same day, fresh semen will be required from your partner for fertilisation. Masturbation is not always possible immediately and "on demand". It is therefore important to address the "problem" of collecting semen so that we can find a prompt solution at our centre. The seminal fluid is processed in the laboratory so that the fertilisation capability of the sperm contained in it is optimal. Now the egg and the semen cells are combined in a nutrient liquid and cultured in an incubator for

24 hours. Then, a maximum of three fertilised eggs are further cultured and allowed to mature for another 24 hours in the incubator.

Any remaining fertilised egg cells – in which a fusion of genetic material has not yet occurred – can be frozen for subsequent cycles (cryopreservation)*.

Transplantation of the Embryos

The transplantation of a maximum of three embryos into the uterine cavity is done using a thin, flexible plastic tube that is inserted into the uterine cavity through the vagina. The transfer is painless. The more embryos that are introduced into the uterus, the higher the risk of multiple pregnancy.

The embryo is transferred into the uterine cavity using a thin, plastic tube

Assisted Hatching* of the Embryo

Under certain conditions (for example, multiple unsuccessful embryo transplants), the attempt will be made to increase the chances of a pregnancy by making it easier for the embryo to slip out of the egg membrane. When this is done, immediately before the embryo is introduced into the uterus, a tiny opening is made in the external envelope of the embryo using a laser, for example. However, there is no scientific evidence to date that documents an improvement in the outlook for success using this method.

Post-Treatment

Approximately two weeks after transplantation of the embryo, the first pregnancy test is done.

At this point in time, however, it is too early to be able to tell which course the pregnancy will take. We do recommend that you and your body try to relax. Despite the nervous tension you should try to find peace and relaxation. You should, however, leave your daily (work) activities substantially unchanged. In order to be sure how the pregnancy will progress, we or your gynaecologist will perform a number of follow-up examinations. It often makes

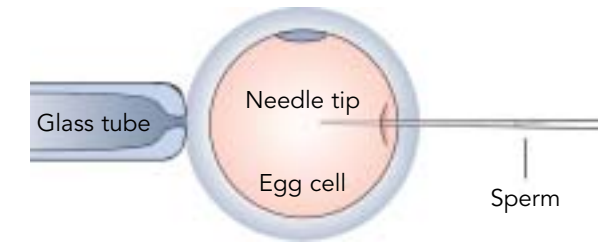
good sense to assure the embryo's implantation by administration of certain hormones (progesterone, for instance) in the second half of the cycle. This is called luteal phase support*.

Follow-up of the course of the pregnancy is important in the post-treatment phase

Microinjection (ICSI = intracytoplasmic sperm injection)*

If sperm motility and quantity are limited, another form of IVF can be done. Here, too, initially several eggs are harvested using hormonal stimulation and follicular puncture.

Since the small number of motile sperm makes fertilisation in the test tube a bit iffy, another method must be selected. Under a special microscope a single sperm is sucked up into a fine hollow glass tube and injected directly into the egg cell (Fig. 10).



(Fig. 10)

This micro-injection thus imitates the natural process of penetration of one semen cell into the egg cell. The fusion of the cell nucleus of the semen cell and the egg cell is not affected by the process. If fertilisation and cell division has taken place, the embryo, as in the IVF procedure, will be introduced into the uterus in five days.

ICSI is used when the number of sperm is very low

Surgical Harvesting of Sperm

In certain cases (where there is total blockage of the sperm ducts, for example), there is no sperm at all in the ejaculate. Nevertheless, it is still possible to harvest sperm directly from the testicles (TESE = testicular sperm extraction)* or from the epididymis (MESA = micro-



surgical epididymal sperm aspiration)*. In this process, tissue samples that generally contain sperm are taken in a minor surgical procedure.

Freezing Egg Cells (Cryopreservation)

When, in the context of IVF treatment, the sperm have penetrated more than three egg cells, but fusion of the genetic material has not yet occurred, it is possible to keep these egg cells (in the pro-nuclear stage)

for several years by freezing them. The advantage offered by this procedure is that hormonal stimulation and egg cell harvesting does not have to be repeated if pregnancy has not occurred in a treatment cycle. The procedure is proven and safe but does result in a low pregnancy rate. It is therefore important that you make clear to us in advance whether any supernumerary egg cells in the pro-nuclear phase should be frozen.

By freezing egg cells in the pro-nuclear stage, treatment can be done more conservatively

The Steps in IVF Treatment – An Overview

Preparation Phase	Stimulation Phase	Ovulation, Harvesting, Transplantation	Luteal Phase Support
1. If necessary, down regulation of the body's own production of fertility hormones in order to optimally adjust the woman's cycle to hormonal stimulation.	2. Several egg cells are brought to maturation in the ovaries by hormonal stimulation.	3. Ovulation is triggered. 4. Egg cell harvest. 5. Fertilisation of the egg cell in the test tube. 6. Maturation of the embryo in the incubator. 7. Transplantation of the embryo into the uterus.	8. Improvement of implantation conditions by administration of hormones.
Medications	Medications	Medications	Medications
GnRH agonists	GnRH antagonists or HMG (urinary) or FSH (bioengineered) or FSH + LH (bioengineered)	HCG (urinary or bio-engineered)	Progesterone, vaginal



The Chances

Many factors come into play to decide the success of the treatment procedures. Along with the nature and duration of the fertility disorder, the woman's age plays a dominant role. It is therefore impossible to give a number.

Overview of the Success Rates of Treatment Options

As a whole, the treatment methods used today have approximately the same success rate per cycle as a natural pregnancy (about 25%), if they progress as planned.

If conditions are favourable, generally 60% of all affected couples can be helped by exhausting all treatment options.

The chances of successful fertility treatment approximate those of natural fertilisation



The Risks

Over-Stimulation

We carefully monitor hormonal treatment because of the risk of over-stimulation. This means that the ovaries produce large numbers of over-sized follicles, which in turn secrete increased hormones. This over-functioning can result in nausea and fluid retention with accompanying pain in the abdomen. If you experience increasing body discomfort, you must notify us immediately. If the over-stimulation is too strong, treatment in the hospital may be necessary in rare cases. The risk of serious over-stimulation can be reduced to 1–2% through regular follow-ups. Your proactive co-operation is needed by faithfully keeping the appointments.

Multiple Pregnancy

The production of a great many follicles during over-stimulation also means the risk of a multiple pregnancy (twins or triplets, for example). Therefore, sexual intercourse during over-stimulation is not recommended. As a rule, the chance of multiple pregnancy in IVF is increased (20–30%), because multiple embryos are generally (max. 3) implanted into the uterus in order to assure success. How

many egg cells are fertilised and implanted must be determined before the attempt.

Miscarriage

In natural procreation, approximately 12–15% of pregnancies terminate in a miscarriage. In IVF the risk increases slightly, but this can be attributed predominantly to the older age of the patients.

Surgical Complications

Complications are rare in the context of the surgical procedures used for IVF. When harvesting eggs, for example, infection or injury to organs can occur.

Psychological Stress

The entire treatment is associated with examinations, appointments, and many expectations. All of this can result in psychological stress, which should be addressed often in discussions with your doctor.

What Do Health Services Pay?

The costs of diagnosing fertility problems are generally covered by health services. In the case of the treatment procedures, however, there are different limitations depending on the method. Therefore, it makes sense to discuss this with your doctor early in the process so that you can better estimate the costs scenario.

Because the framework of costs coverage can change, you should ask your doctor about the current situation

The Provisions in Detail	
Treatment Method	Paid by the Statutory Health Services ²
Stimulation: Without insemination	No limit
Insemination ^{1, 2} :	
In the spontaneous cycle or with "timing"	8 cycles
In the stimulation cycle (gonadotropin)	6 cycles
IVF and / or ICSI ^{1, 2, 3, 4, 5} :	4 cycles

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¹ Only for married couples.

² Insemination, IVF and ICSI only up to age 40 in the woman; thereafter, only exceptional cases.

³ No regular benefits after sterilisation.

⁴ If after two IVF or ICSI attempts there is no fertilisation of the egg cell (in the test tube), the health service will not approve another attempt because there is no expectation of success. Exceptions must be approved in advance by the health service.

⁵ If no pregnancy occurs after the fourth treatment, your physician must justify to the satisfaction of the health service why treatment should be continued.

Since the birth of the first IVF baby in 1978 in England, the discussion concerning the legal framework still continues in Germany. Since January 1, 1991, the Embryo Protection Law has been in effect, which regulates the use of reproductive technologies and the handling of embryos. For example:

- The fertilised egg cell capable of development is considered to be an embryo from the time of fusion of the genetic material.
- Transfer of the partner's semen is allowed. Donor semen may be transferred only under certain statutory conditions.
- IVF and ICSI may be performed only by specially trained physicians.
- Cryopreservation of egg cells in the pronuclear stage (the semen cell has already penetrated the egg cell, but the genetic material has not yet fused together).

Prohibited :

- The transfer of more than three embryos into the uterine cavity.
- Donor egg cells.
- Surrogate mothers.
- Destructive* experiments using embryos.

With respect to the statutory framework conditions, we assure you that we comply with the provisions of the law. We handle your egg cells and your semen cells very responsibly because each fertilised egg represents an embryo to us and consequently is a human life.

You should also be aware that your personal data are subject to the provisions of data protection laws. All personal information or data are treated as strictly confidential. Anonymously collected data are used only for statistical evaluations relevant to quality control.

If you decide to undergo treatment, you may need to have people around you with whom you can talk. This is even more important if you need to convince yourself that you are doing the right thing by your decision.

During treatment, and particularly if a cycle is unsuccessful, you need the support of people you trust to help you get past the disappointment. Along with the medical and psychological care that we can gladly provide, we do highly recommend contacting a self-help group. In such a group, you can exchange experiences and concerns with people in a similar situation.

The association of self-help groups for infertility issues – Wunschkind e.V. – will be happy to provide you with the address of a self-help group near you.

Information on the Internet

www.fertinet.de
www.repromed.de
www.wunschkind.de

Useful Addresses

Wunschkind e.V.
Association of Self-Help Groups for Infertility Issues
Fehrbelliner Straße 92
D-10119 Berlin
Tel.: 0049 (0)180 - 5002166
Fax: 0049 (0)30 - 69040838
Hotline: Tuesdays from 19:00 to 21:00
Email: wunschkind@directbox.com

National Association of Reproductive Medicine Centers Germany e.V.
Dudweilerstrasse 58
D-66111 Saarbrücken
Tel.: 0049 (0)681 - 373551
Fax: 0049 (0)681 - 373539
Email: brz@repromed.de

Pro Familia-NATIONAL ASSOCIATION
Stresemannallee 3
D-60596 Frankfurt
Tel.: 0049 (0)69 - 639002
Fax: 0049 (0)69 - 639852
Email: info@profamilia.de

How often can IVF treatment be done?

There is no general rule. If pregnancy occurs, this will happen generally in the first four treatment cycles.

How long does the treatment last?

According to the woman's cycle, 4 weeks. Between cycles, a break of 1 to 3 months is recommended.

Who assumes the costs of IVF treatment?

The health services pay for 4 IVF treatment cycles. Additional treatments are paid in exceptional cases upon adequate justification.

Can the child suffer any injury in its development due to IVF treatment?

According to current information, children who were produced using IVF do not have an increased incidence of disorders (malformations, for example). In children who have been produced using ICSI, this rate can be slightly increased.

Can I get cancer from hormonal therapy?

According to current information, there is no risk of cancer because of hormonal therapy.

Can I become infected by the treatment?

When manufacturing the hormones, various procedures are done that are prescribed by law, so that a high degree of purity can be guaranteed. This process kills all known germs and removes them. Thus, in the case of urine products, a risk of infection can be by and large excluded and is not possible in the case of bioengineered products.

How are bioengineered hormones produced?

In the manufacturing process, special cell lines are raised in a culture medium and produce hormones of uniformly high purity and quality.

Androgens

Male hormones.

Assisted hatching

Tearing the external envelope of the embryo, for example using a laser, in order to facilitate the embryo's implantation in the mucosal membranes of the uterus.

Cryopreservation

Greek word: kryo = cool, frosty. Egg cells in the pro-nuclear stage can be deep frozen by cryopreservation.

Down-regulation

A reduction of the body's own production of hormones by using medicines.

Egg cell transfer

Transfer of an egg cell into the uterus after fertilisation outside of the body.

Embryo

Once the genetic material merges, we refer to an embryo. From the 13th week of pregnancy, the developing child is referred to as a foetus (also fetus).

Endometriosis

A word compounded from the Greek: endo = inside, metra = uterus. A frequent cause of infertility. In endometriosis, tissue from the uterine mucosa migrates outside of the uterus and can cause scarring there.

Follicle

A fluid-filled egg capsule, in which the egg cells are found. The follicles mature in the ovaries.

Follicle puncture

Puncture of the follicle using a very fine needle in order to harvest an egg cell.

FSH

Follicle stimulating hormone that promotes growth and development of the egg cells.

GnRH

Gonadotropin releasing hormone. Greek-English compound word: gonos = procreation, trop = effect. Hormone that causes the release of LH and FSH.

GnRH agonist

A medicine for inhibiting the release of LH and FSH (after initial release of these hormones).



GnRH antagonist

Greek word root (anti = against). Medicines that prevent the release of the fertility hormones LH and FSH.

HIV infection

The infection caused by the AIDS virus.

Hormone

The body's own messengers between various organs.

Human chorionic gonadotropin (HCG)

Latin compound word: human, chorion = egg skin, gonad = sex glands, trop = effect. A pregnancy hormone that is used as a medicine for triggering ovulation. HCG is extracted from the urine of pregnant women or is manufactured using bioengineering.

Human menopausal gonadotropin (HMG)

Latin compound word: human, menopause = end of menstruation. HMG is extracted from the urine of women going through menopause. HMG is used for stimulating the ovaries.

Intracytoplasmic sperm injection (ICSI)

Latin compound word: intra = in, into, cytoplasm = cell contents, spermium = male semen cell. A method of artificial insemination in which a single sperm is injected into an egg cell using a thin, hollow needle.

Intrauterine insemination (IUI)

Insemination is the transfer of semen into the vagina or uterus using technical methods. In IUI, the semen is placed in the uterus as close as possible to the egg.

In vitro fertilisation (IVF)

Latin compound word: in vitro = in glass. IVF means fertilisation outside of the body.

Luteal phase support

The luteal phase is the time during which the body produces progesterone. A support of the luteal phase is required if the woman produces too little progesterone.

Luteinizing hormone (LH)

A hormone that triggers ovulation.

Measles

An infectious disease caused by the rotavirus. A measles infection during pregnancy can cause serious defects in the child.

Myoma

A benign tumour in the uterus that consists of muscle tissue. Myomas can often be the cause of persistent infertility or miscarriages.

Oestrogen

A Latin compound word: oestrus = readiness to copulate, gen = produce. Oestrogen is a female sex hormone that is produced in the ovaries and serves in building up the uterine mucosa.

Out-patient

Not involving admission to hospital (in contrast with inpatient treatment).

Ovaries

Twin, plum-sized female organs in which the egg cells capable of being fertilised are produced. The ovaries produce the hormones oestrogen and gestagen (gestatio = pregnancy, gen = producing).

Oviducts (fallopian tubes)

Funnel-shaped "conveyor belt" through which the semen cells are guided to the egg and the egg travels to the uterine cavity.

Ovulation

The egg cell leaves the ovary and passes into the oviduct.

Placenta

The placenta provides the developing child with nutrients. After birth, the placenta detaches from the uterine wall and is expelled as the afterbirth.

Polycystic ovary (PCO)

Derived from the Greek kystis = capsule and poly = numerous. An ovary with numerous small cysts.

Progesterone

A Latin compound word: pro = for, gestatio = pregnancy. Progesterone is produced by the corpus luteum. Progesterone prepares the uterine mucosa for implantation of the embryo.





Prolactin

A Latin compound word: lactis = milk. A hormone produced in the brain. Prolactin brings about lactation.

Prostate

A chestnut-sized gland in men that is located under the urinary bladder. The prostate secretes material into the seminal fluid that supports the motility of the sperm.

Sterilisation

Tying of the sperm ducts in the man or the oviducts in the woman in order to produce infertility.

Sterility

If no pregnancy occurs with regular sexual intercourse over the course of one year, physicians assume sterility (infertility). This is not necessarily final.

TESE / MESA

If there are no sperm at all in the ejaculate, it is possible to extract sperm directly from the testicles (TESE = testicular sperm extraction) or from the epididymis (MESA = microsurgical epididymal sperm aspiration).

Thyroid stimulating hormone (TSH)

A hormone that stimulates the thyroid gland (glandula thyroidea).

Tubal pregnancy (extrauterine pregnancy)

Implantation of the embryo in one of the oviducts instead of in the uterine cavity.

Uterine mucosa (endometrium)

A richly vascular mucus membrane that is formed periodically by the uterus. The embryo implants itself in the uterine mucosa.

Uterus

A pear-shaped organ in which the baby develops. The uterus consists of the cervix of the uterus, the uterine neck, and the uterine cavity. The two oviducts open into the uterus.

Yellow body (corpus luteum)

The remnant of the follicle after ovulation, which takes on a yellowish colour after transformation; hence, yellow body.

Questions that have not yet been answered:





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