



• IUI •

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procréation médecine assistée
CHC @ occidant

INTRAUTERINE INSEMINATION



INTRODUCTION

A couple's decision to have a child is an important moment psychologically. When the couple have not succeeded in having a child after 1 to 2 years, one can talk of sterility or infertility. The infertility may have its origin in either the woman or the man and in fact, very often, both members of the couple are concerned. Sterility is rarely absolute. It is in fact a reduction in the chances or the probability of conception within a timeframe that is considered to be normal.

One couple out of six will be affected by this difficulty in procreating.

The analysis carried out by the gynaecologist will make it possible to define which method of Assisted Reproductive Technology (ART) will be the most suitable in helping you to realize your project of having a child.

The purpose of this brochure is to explain one of these assisted reproduction methods to you, namely **intrauterine insemination** or **IUI**.



Q BACK TO THE BIOLOGY CLASS: OUTLINE 1

For a better understanding of the sequence of examinations carried out by your gynaecologist and of the different forms of treatment undertaken, one must bear in mind the natural process of conception.

Ovulation, i.e. the production of the egg (called oocyte or ovum) in the woman requires 14 days on average. During these 14 days, the pituitary gland, a gland situated in the brain, secretes a hormone which stimulates the ovary: FSH.

The ovary is the oocyte production centre. There are 2 of these, one on either side of the uterus at the end of the Fallopian tubes.

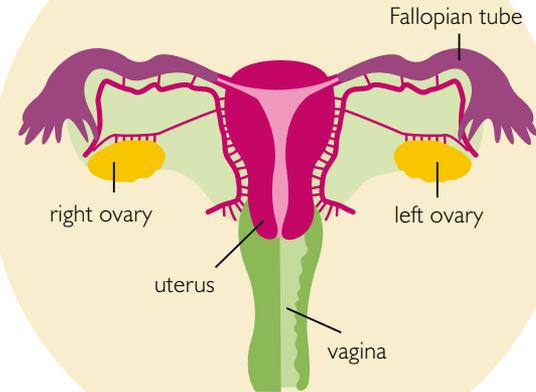
During these 14 preparatory days, the secretion of FSH increases and it stimulates the growth of the cells which surround and prepare the oocytes: this cluster of cells is called the follicle. The follicle is easily identified on an ultrasound scan because it is full of a clearly visible fluid, giving a rounded image which can be measured during the cycle.

Certain of these cells secrete hormones: first and foremost oestrogens. Oestrogens have several roles: they improve the quality of the cervical mucus which is found in the cervix of the uterus. After sexual intercourse, this mucus stores the spermatozoa which it will then release in a continuous way for 48 to 72 hours so that they may encounter the oocyte at the right time.

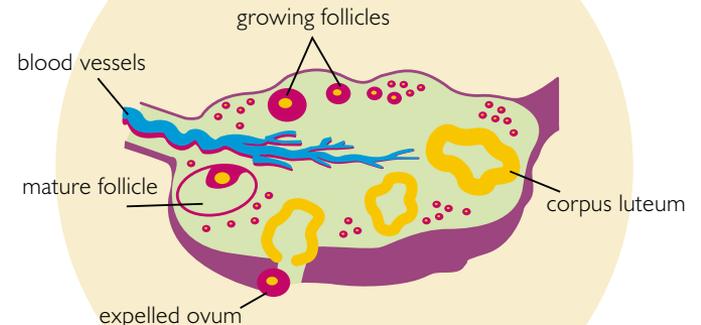
In a normal ejaculation, more than 20 million spermatozoa per ml are deposited in the vagina.

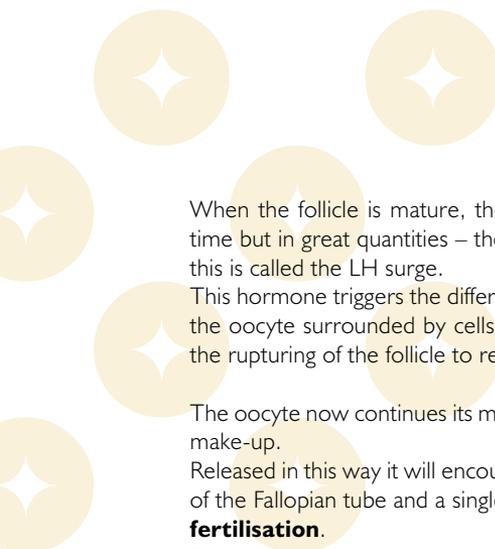
Oestrogens also prepare the internal surface of the uterus to receive the embryo; this surface is called the endometrium and it thickens during these 14 days.

Location of the ovaries



structure of an ovary





When the follicle is mature, the pituitary gland secretes – for a short time but in great quantities – the hormone which will trigger ovulation: this is called the LH surge.

This hormone triggers the different stages of ovulation: the detaching of the oocyte surrounded by cells (the cumulus) in the follicular fluid and the rupturing of the follicle to release the oocyte into the abdomen.

The oocyte now continues its maturation process by adapting its genetic make-up.

Released in this way it will encounter the spermatozoa in the outer third of the Fallopian tube and a single spermatozoon will penetrate it: this is **fertilisation**.

From this moment, the embryo constituted by the fusion of the male and female reproductive cells will embark on a long process of successive divisions, while progressing towards the cavity of the uterus.

The implantation of this embryo will take place 7 days later and after 9 months the development of the embryo will result in the birth of the child.

Natural fertility in human beings is not 100%: each couple at each cycle has an average chance of 20% of achieving a pregnancy.

The age of the future parents is an essential element in the prognosis. Fertility decreases after 30 years of age and infertility increases beyond 35 years in women and 45 in men.

Account must therefore be taken of these two factors – age and the number of cycles during which fertile intercourse has taken place – in order to establish an assessment of infertility or accelerate the use of a treatment to assist procreation.



B. ASSESSMENT OF THE FERTILITY OF THE COUPLE

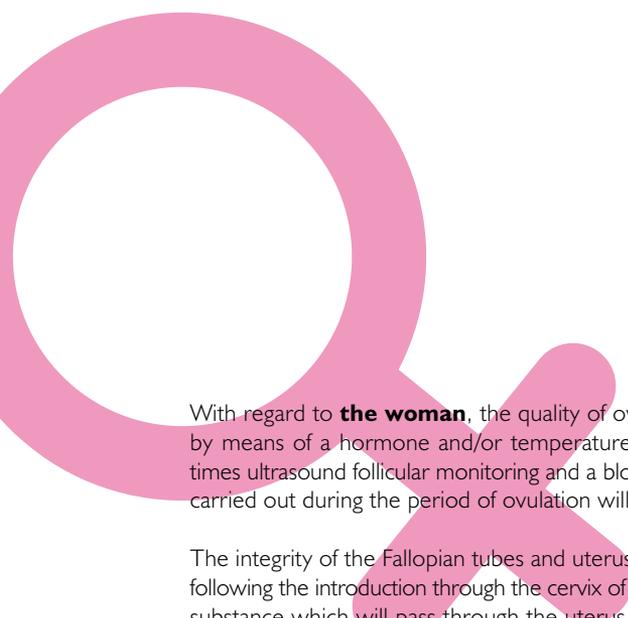
Testing the fertility of the male begins by carrying out an analysis of the semen under very strict conditions: semen analysis.

The semen must be collected by means of masturbation into a sterile recipient and this must be delivered to the laboratory at body temperature within a maximum of 45 minutes.

In the sample brought to the laboratory, the biologist will count the number of spermatozoa and assess their mobility, vitality and morphology.

With a view to treatment in the ART laboratory, the male partner must also give a blood sample to screen for certain transmissible diseases or ones which could have an impact on fertility: hepatitis B, hepatitis C, syphilis, AIDS, cytomegalovirus, Chlamydia.

If the semen is abnormal, other examinations may be recommended, such as a clinical examination and a hormone – even a genetic - check-up and an ultrasound scan of the testicles.



With regard to **the woman**, the quality of ovulation must be assessed by means of a hormone and/or temperature profile check-up; sometimes ultrasound follicular monitoring and a blood-hormone examination carried out during the period of ovulation will also be scheduled.

The integrity of the Fallopian tubes and uterus will be assessed by x-ray following the introduction through the cervix of the uterus of a radiopaque substance which will pass through the uterus and Fallopian tubes as far as the abdominal cavity: hysterosalpingography.

Sometimes the examination of these organs and the abdominal cavity requires the use of surgery with the carrying out of a laparoscopy or coelioscopy: a camera is inserted under general anesthesia into the abdomen by means of an incision under the umbilicus.

Sometimes the interaction of the sperm with the mucus of the cervix of the uterus is assessed by means of the Huhner or post-coitus test. This is carried out just before ovulation and involves a microscopic analysis of a sample of the mucus taken 4 to 6 hours after sexual intercourse.

Before any procreation, the gynaecologist will have checked the immunity of the future mother with regard to diseases which are dangerous during pregnancy, such as Rubella, toxoplasmosis, cytomegalovirus, chickenpox etc.

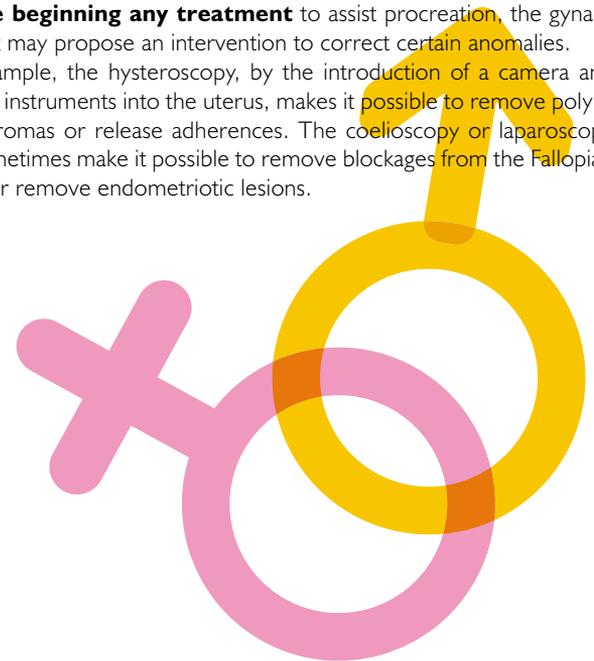
After this assessment, the couple will be referred for treatment to solve the anomalies which have come to light.

It may be that several causes of sterility are found: this is described as mixed infertility.

Sometimes no cause is found despite the absence of pregnancy: this is called idiopathic infertility.

Before beginning any treatment to assist procreation, the gynaecologist may propose an intervention to correct certain anomalies.

For example, the hysteroscopy, by the introduction of a camera and surgical instruments into the uterus, makes it possible to remove polyps and fibromas or release adhesions. The coelioscopy or laparoscopy will sometimes make it possible to remove blockages from the Fallopian tubes or remove endometriotic lesions.

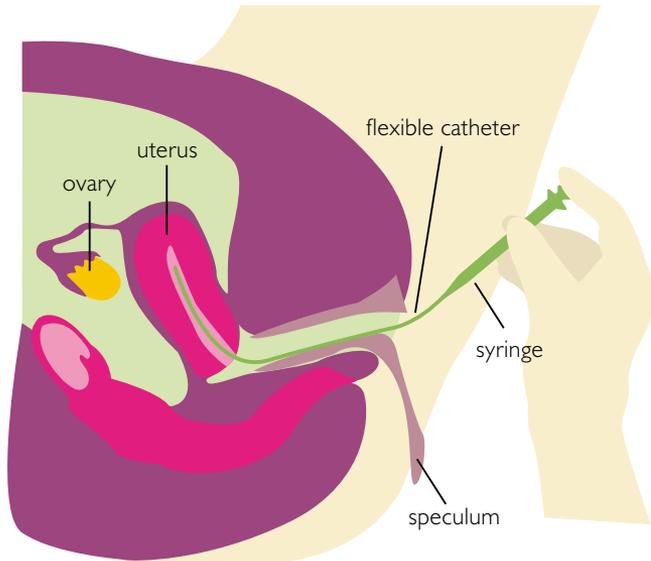




C. HOW INTRAUTERINE INSEMINATION TAKES PLACE

Introduction

Intra-uterine insemination is a simple, painless technique which consists of introducing, by means of a small flexible catheter, a high concentration of sperm through the cervix into the cavity of the uterus at the time of ovulation.



This is an old technique first applied in 1790 by John Hühner who used a feather.

At present, this technique is in widespread use and is, in appropriate indications, the first-line treatment for infertile couples.

More than 800 intrauterine inseminations take place every year at the CHC Saint-Vincent de Rocourt.

To carry out intrauterine insemination, at least one permeable Fallopian tube is necessary. Slight to moderate semen disorders are a good reason to perform intrauterine insemination. It is also the preferred treatment for cervical and idiopathic infertilities in most cases.

Before starting treatment, an agreement between the ART centre and the couple must be signed: this is a legal obligation. The doctor will give you the document and you will be asked to return it, signed by both members of the couple, to the doctors, nurses or secretariat BEFORE treatment is begun.

The different stages in insemination

Registering:

Before the 5th day of the cycle (1st day of the cycle = 1st day of menstruation), the couple will call the ART Center of the CHC Saint-Vincent de Rocourt on a weekday from 8.30 to 16.00 hours at 04/2394775.

1 Optimising ovulation

In order to increase the chances of success or to correct ovulation disorders, intrauterine insemination is sometimes associated with treatment to stimulate ovulation. This will begin during the first 10 days of the cycle, either by oral administration of medication or by subcutaneous injections. This treatment will be accompanied by close monitoring to avoid multiple pregnancies.

2 Monitoring of ovulation

This monitoring evaluates the number of eggs maturing and the time of ovulation. It is extremely important because the egg can only be fertilised for a short time after its release from the follicle (16 to 24 hours) and the sperm must therefore be placed in the uterus at the right time to meet it.

During sexual intercourse, if the cervical mucus functions properly, it maintains the sperm for 48 to 72 hours, releasing them continuously to search for the egg in the Fallopian tube. The time of intercourse is therefore of little importance if its within those 48 hours. On the other hand, in the case of intrauterine insemination the spermatozoa are placed directly in the cavity of the uterus, beyond the cervical mucus, and if they do not meet an egg quickly they will both lose their fertilising power.

Ovulation is monitored, with a vaginal ultrasound scan, by measuring the diameter of the follicles which evaluates the maturity of the oocyte. Measuring the thickness of the endometrium makes it possible to ensure that the conditions are right for embryo implantation. Hormone assays, which measure oestrogen levels, also allow to assess the maturity of the oocyte.

Finally, the determination of the LH surge which triggers ovulation allows the prediction of ovulation within 24 hours approximately.

One to five consultations during a cycle will be necessary for this monitoring. They will take place on appointment from 7 a.m. on, will last 10 minutes and will be carried out in the consultation office of the ART center on the second floor of the CHC Saint-Vincent de Rocourt. The first one will take place between the 9th and 14th day of the cycle as decided by the gynaecologist and the following appointments will be communicated by our nurses in the afternoon, following receipt of the results of the morning examinations.

If you live far way, your own gynaecologist may carry out these ultrasound scans and you can have your blood samples taken in a laboratory near to you, on condition that all the results reach us before 14.00 hours, by telephone to the nurses (**04.2394741 / 04.2394742**) or by fax (**04.2394779**).

3 Induction of ovulation

When the follicle has reached the right size (16 to 25 mm) and its cells are secreting a sufficient quantity of oestrogens (+/- 150 to 300 pg/ml per oocyte), ovulation may be induced on by a subcutaneous injection of 5000 units of Pregnyl®.

If the patient has not started her LH surge, a hormone can be injected indeed, which will replace this and ovulation will take place 36 hours later. This is to avoid prolonged ultrasound and blood testing and to schedule insemination 28 to 36 hours later at one's ease.

The injection will be either subcutaneous or intramuscular and will take place at +/- 7 PM.

The different stages in insemination

4 Preparation of the sperm

The semen is collected by masturbation.

This may be carried out at home if transport does not exceed 45 minutes.

In the contrary case, a special room is reserved at the ART centre.

Receipt of the sample is expected 2 hours before the appointment scheduled for insemination (2nd floor of the clinic, ART center, andrology room).

No abstinence is required during the ovulation-observation phase. Abstinence will be required from the time of the injection of Pregnyl® in the female partner or the detection of her LH surge, i.e. from 24 to 48 hours. It is desirable, however, that this abstinence should not exceed 5 days.

The preparation of the sperm, also called capacitation, has the objective of making the sperm fertile by means of several washing and centrifugation processes through different mediums.

This eliminates the seminal fluid and the factors which inhibit the capacity to fertilise; it improves the mobility of the spermatozoa and selects the most mobile of them for inclusion in a small volume to be inseminated.

Semen consists of 95% seminal fluid and 5% spermatozoa and it cannot be injected as it is into the uterus. This would cause contractions because of certain chemical substances (prostaglandins) and the excessively large volume of the ejaculate (1 to 7 ml). Infections could also occur as the mucus of the cervix of the uterus is no longer playing its role as a filter.

When preparation is complete, 300 to 500 micro-litres of sperm will be inseminated, containing a concentration of more than a million spermatozoa per ml.

5 Insemination

On the appropriate day, 2 hours after the semen has been delivered, which will allow the time necessary to prepare it, the female partner will be asked to present herself. Once it has been prepared, the sperm may be kept for several hours without losing any of its properties.

The patient will be set in the gynaecological position, a speculum will be put in place and the cervix cleared of its secretions. A thin catheter will be inserted through the cervix and, with the help of a syringe, the sperm will be deposited at the top of the uterus. This medical procedure takes 5 minutes and is painless. You may be asked to stay lying down for some minutes on the gynaecology table. (Cf. Page 10)

Insemination is not painful but in 10% of cases the passage through the cervix may be difficult and can require several manipulations which might cause a brief uterine contraction.

After insemination, the patient may resume her activities without any restrictions, including a normal sexual life.

6

After insemination

In the course of the 2 weeks following insemination, fertilization may take place and then the implantation of the embryo after its progress through the Fallopian tube.

You will be asked from the day following insemination to introduce a Utrogestan® tablet of 200 mgr in your vagina every evening to promote implantation. This treatment will be continued until a blood sample is taken to determine whether a pregnancy has started. In the event of pregnancy the treatment will be continued, in the event of failure, Utrogestan® will be discontinued.

While you are on Utrogestan® your period may be delayed, without necessarily meaning that you are pregnant: only a blood test can diagnose pregnancy with certainty.

To verify that conditions are favourable for implantation, a blood test to check hormone levels is sometimes carried out.

If menstruation has not occurred 14 days later, the couple will be asked to come for a blood test which will confirm the pregnancy.

Two weeks after a positive blood test for pregnancy, the first ultrasound scan will confirm the presence of a living embryo in the uterus.

It is the moment for you to get an appointment with your attending gynaecologist who will look after your pregnancy and delivery.

You will be asked to contact the ART Center again to inform us about the birth of your child and its delivery.



D. SUCCESS RATES OF INTRAUTERINE INSEMINATION

The pregnancy rate achieved after a cycle of intrauterine insemination is 15% to 20%.

This rate is obtained through stimulation of ovulation, monitoring of follicular development and optimum preparation of the sperm.

Intrauterine insemination is not indicated in severe pathologies where it gives only poor results, nor in more difficult prognosis conditions, such as patients over 40 years of age or infertilities lasting longer than 4 years.

A consultation or telephone discussion with the gynaecologist of the ART Center is essential after 2 cycles of treatment in order to optimise the management of the following 2 intrauterine insemination procedures.

After 4 unsuccessful procedures, another procreation-assistance procedure should be proposed by the doctor and discussed with the couple.

A study of intrauterine insemination cycles has shown that 94% of awaited pregnancies are achieved after 4 to 6 cycles and we will therefore propose recourse to in vitro fecondation after the unsuccessful cycles.

One out of three couples who have recourse to intrauterine insemination will not need in vitro fertilisation.



C. SIDE-EFFECTS IN INTRAUTERINE INSEMINATION

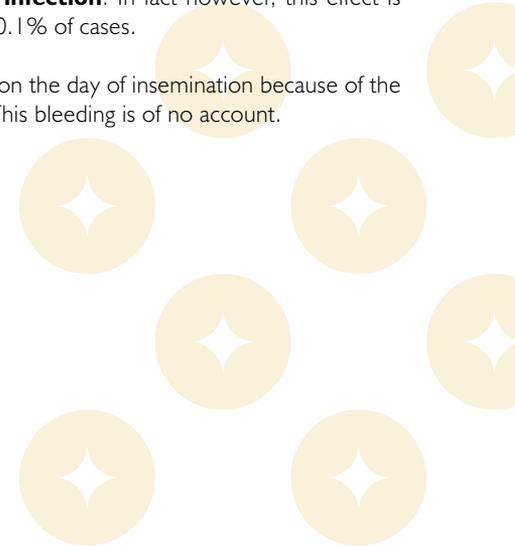
Side-effects in intrauterine insemination are rare:

- 1 **Multiple pregnancies** linked to ovarian stimulation. If this risk appears to exist in the light of the ultrasound-scan and blood-test results, one can decide to adopt preventive approaches:
 - a. Interrupt the cycle, or
 - b. Reduce the number of follicles, or
 - c. Shift this IUI cycle to in vitro fecondation cycle allowing to decide on the number of embryos to be replaced in the uterus.

Follicular reduction is the approach most frequently adopted. It consists of emptying out the supernumerary follicles using a fine needle inserted under ultrasound by the vaginal route, in order to decrease the number of fertilisable eggs. This procedure takes place in the operating theatre and lasts 20 minutes. A slight, brief pain like a period pain may be associated with it.

Nevertheless, despite very close monitoring and the preventive approaches adopted, the rate of multiple pregnancies is in the order of 10 % in the case of stimulation.

- 2 When intrauterine insemination is performed, the passage through the cervix of the uterus may be difficult and this may cause a **brief pain** resembling that felt at menstruation.
- 3 The passage of the vaginal catheter into the uterus may bring with it germs which could cause an **infection**. In fact however, this effect is seen very rarely, in less than 0.1 % of cases.
- 4 **Slight bleeding** may occur on the day of insemination because of the manipulations of the cervix. This bleeding is of no account.



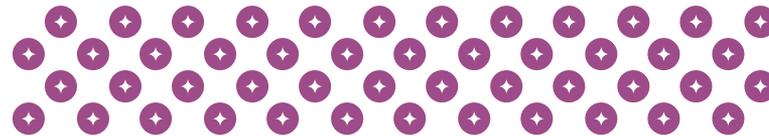


CONCLUSION

Intrauterine insemination is a simple technique to assist procreation which, when the conditions permit, must always be envisaged as a first-line option for the treatment of infertility. It takes place over 4 to 6 cycles and enables one couple out of three to avoid recourse to more invasive techniques.

We want all couples desiring a pregnancy to become happy parents as soon as possible and in the simplest way possible.

We thank you for the confidence you are showing us and remain at your disposal for any additional explanations which might seem necessary to you.



THE REPRODUCTIVE medicine Team

If you would like to have further information, do not hesitate to contact a member of the team:

Secretaries of the ART department: appointment centre

Ms Martine SAUVEUR
Ms Véronique DANIEL
Ms Nathalie LESSUISE
Ms Stéphanie PONCIN
Tel.: 04 239 47 75

Administrative secretaries:

Ms Carine GARNIER
Tel.: 04 239 46 24
Ms Chantal SCHUGENS
Tel.: 04 239 46 22



Nurses in the MAR department:

Ms Claudine BOOSSY
Ms Anne-Pascale HOGGE
Ms Martine LAURENT
Ms Ilse ORY
Ms Claudine JACQUE
Tel.: 04 239 47 42 – 04 239 47 41

Psychologists:

Ms Marie FAFCHAMPS
Ms Catherine MOTTE
Tel. : 04 239 47 75

Coordinating gynaecologists:

Dr Annick DELVIGNE
04 239 47 93
Head of Department
Dr Stéphanie DEMELENNE
0475 32 33 94
Dr Pierre-Arnaud GODIN
0496 86 63 01
Dr Yves LEBRUN
0471 82 88 03



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