

# Investigating Infertility

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## Curriculum vitae

Alan Alperstein qualified at Wits in 1974; he obtained the MRCOG in London in 1980. From 1981-1984 he was head of the infertility clinic at the Department of Obstetrics and Gynaecology at the University of Cape Town Medical School. He studied microsurgical techniques in Belgium and in vitro fertilisation in Melbourne. He has personally successfully delivered 5 "test-tube" babies. He is married to Angela and they have 3 children.

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**T**he term 'infertility' is defined as the inability to achieve a pregnancy after one year of regular unprotected intercourse.

## Scope of the problem

Approximately 3,5 million or 20% of all married couples in the United States of America, will have difficulty achieving natural parenthood (American Infertility Society). However, with proper medical evaluation and treatment, approximately 50% of these infertile couples, can accomplish a pregnancy within a reasonable period. There are no figures available for South Africa, but with changing morality and the epidemic proportions of pelvic inflammatory disease, it is expected that our figures will compare with those of the USA.

## Factors to consider in solving the problem

In attempting to solve the problems of infertility, it is important to realise that there are many medical

## Summary

*Infertility has become a major problem also in the RSA, and this article is written for the GP, who is the first line of contact. Guidelines are given for investigating the problem as well as managing it with both partners concerned.*

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**KEYWORDS:** Infertility; Reproduction; Age factors; Attitude; Life style

as well as non-medical causes. Infertility can occur at any age and at any time.

The peak human reproduction in both sexes is usually between the ages of 21 and 25. Beyond the age of 25, fertility declines with succeeding years. This occurs less dramatically with males however, and with no abrupt end as with females.

At age 25 for example, the chance of a woman conceiving within 6 months is 75%. In the late 20s, 47%, and in the early 30s, 38%. In the late 30s, 25% and after 40, 22%.<sup>1</sup> Thus the older the couple, the more difficult it is to achieve a pregnancy. In our modern society, many couples are putting off parenting until having established themselves in their career choices. This obviously is a cause of the increase in infertility added to the above mentioned factors.

Today 90% of the causes of infertility can be identified. About 40% are of female origin, 40% in male patients and about 20% will relate to factors in both partners.

With recent advances in the treatment of male infertility, and with the advent of *in vitro* fertilization our attitude to some of the more problematic causes of infertility has been revolutionised. Ovulation induction is a well established modality of therapy, and with new advances in the use of gonadotrophin release hormones, the pregnancy rates have improved, and complications appropriately diminished.

## General factors which influence reproduction

Infertility can be caused by certain lifestyles and by previous illness. For example, a ruptured appendix may very well lead to adhesions around the Fallopian tubes, creating difficulty with the ability of the fimbria to pick up the ovum.

Contraceptive practices themselves can actually lead to infertility, eg infection following the use of intra-uterine devices is a well known cause. The use of oral contraceptives in some cases delays the return of normal ovulation once cessation occurs. Some women develop endometriosis leading to pelvic adhesions and interference with ovulation and oocyte retrieval by the fimbria.

## The role of the general practitioner

Being the first line of contact in many cases, the general practitioner will often come across the problem of infertility. Knowing the family well, he can go a long way in treating the couple before referral. It is essential to take a good history and do a thorough physical examination as set out below. The interested practitioner can do the baseline

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*About 20% of all married couples in the USA will have difficulty achieving natural parenthood - and it is expected that this is the situation in RSA as well*

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investigations, interpret the results and where appropriate, implement or continue treatment, or refer for procedures he is not skilled in doing.

It is essential to see both partners. Though pregnancy occurs in a woman's body, it is initiated by both partners and the child is parented by both. Thus a fertility problem is a *couple's* crisis. Yet we should bear in mind that it is a mistake to assume that every applicant for infertility treatment wants to rear children. Their request for treatment may actually reflect psychological or marital problems.

About 70% of couples whose infertility is due to organic causes become pregnant with treatment. Thus patients should be prepared and counselled for the eventuality of "failure" of treatment.

Alternatives should be discussed with them at the time of commencing therapy (ie adoption, fostering, etc). If no pregnancy occurs, the doctor can help to facilitate the grief process. It is natural for anger and sadness to be expressed. The caring doctor can be of great support during this time.

Feelings of personal worth are threatened by infertility. The patients are caught between the

traditional cultural expectation that successful marriages produce children, on the one hand, and on the other, the movement to zero population growth.

The treatment can extend over a long time with high costs in terms of money and pain, both physical and emotional, as well as the possibility of treatment failure.

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*"... the inability to achieve a pregnancy after one year of regular intercourse"*

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Infertility treatment can be stressful for the doctor as well. It involves treatment of emotional patients, who may measure success only in terms of pregnancy. Patients may express their disappointment about their infertility through anger and impatience with the doctor.

Attitudes of both partners towards infertility, investigations and treatment should therefore be assessed. It is hopeless merely investigating one partner to assess the aetiology or management of the problem.

## 1. History

### • Female

Important points to note:

1. duration of infertility and the length of contraceptive or non-contraceptive exposure;
2. fertility in other relationships (self or spouse);
3. obstetric history, particularly complications (intrapartum or post partum) and duration of lactation;
4. gynaecological history - a detailed menstrual history; any history of vaginal infections or any other pelvic infection; the use of intra-uterine contraceptive devices;
5. previous tests and therapy for infertility;

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*Infertility can occur at any age at any time*

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6. medical history - general medical history, including chronic and heredity diseases (eg TB, diabetes, thyroid);
7. surgical history - particularly abdominal or pelvic surgery;
8. a sexual history in detail, with regard to libido, orgasm, techniques, frequency of intercourse and post-coital practices;

9. psychological evaluation:
- general
  - as regards infertility problem, particularly the reasons for seeking help.

## ● Male

1. has his fertility been established? with the present partner? other partners?
2. medical history - general, including sexually transmitted diseases, epididymitis, mumps orchitis, chronic diseases, drugs, any recent febrile episodes;
3. surgical history especially any hernia operations or other surgery in genital area and injuries to the testes;

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*The older the couple the more difficult it is to achieve pregnancy*

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4. occupational - ie exposure to chemicals, x-rays or other forms of irradiation and extreme thermal changes;
5. previous tests and therapy performed for the study of infertility;

6. duration of infertility;
7. sexual history - onset of puberty, coital habits, does ejaculation take place; libido/potency.

## 2. Examination

### ● Female

*General:* A careful examination of other organ systems of the body is necessary. Special attention should be paid to general habitus, fat, hair distribution and presence or absence of acne and galactorrhoea.

*Genital tract:* The state of the hymen and clitoris. Look for vaginal infections. The state of the cervix with regards to polyps, infections, cervical tears and patency of the os. Take note of the uterine size, position and mobility. The adnexae as regards thickening, tumours or fixity.

### ● Male

*General:* Evaluate degree of androgenicity. Blood pressure, status of general health.

*Reproductive system:* Penis, position of urethral opening, testicular size, testicular and epididimal consistency, presence of vas deferens, prostate size and consistency. A careful search should be made for a varicocele (this evaluation best performed in

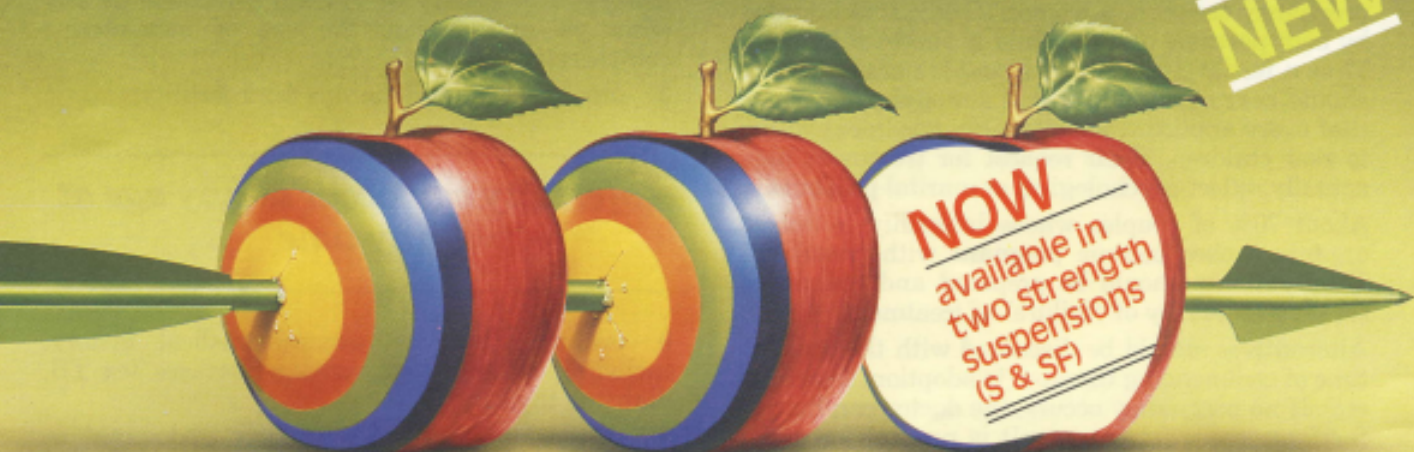
54 AUGMENTIN 5 (suspension). U/20.1.2/49: 125 mg amoxicillin trihydrate BP and 31,25 mg potassium clavulanate per 5 ml.  
AUGMENTIN SF (suspension forte). U/20.1.2/50: 250 mg amoxicillin trihydrate BP and 62,5 mg potassium clavulanate per 5 ml.

## FIRST TIME SUCCESS

*as a matter of routine*

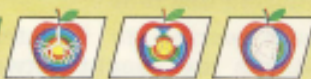
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and urinary tract infections*

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**Contra-indications:** pregnancy, penicillin hypersensitivity, hepatic dysfunction and children under 6 months.  
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an upright position). In small varicoceles reflux of blood flow during a valsalva manoeuvre may be the only physical sign.

## Investigations

In evaluating infertility in women, it is important for the doctor to understand that there are 5 major processes that can lead to the problem.

1. Ovulation
2. The function of the cervix
3. The presence of tubal patency and the ability of the fimbria to pick up an ovum
4. The endometrium
5. The peritoneum.

### ● Female

#### 1. Assessment of ovulation

● A basal body temperature chart. A biphasic shift of temperature of 0,5 to 1°C rise which is maintained for 12-14 days is usually a satisfactory index of good ovulation. The temperature should be taken orally, first thing in the morning on awakening.

● A luteal phase serum progesterone is helpful as an indicator of ovulation.

● Ultrasonographic studies of follicular development within the ovary and changes associated with ovulation are easily detected on ultrasound.<sup>2</sup>

● Endometrial biopsies are appropriate when problems are obtained on basal body temperature charts, which do not correlate with serum progesterone levels. The endometrial biopsy when timed just pre-menstrually will give histological evidence of ovulation and the chronology in the development of the endometrium. Generally, however, the only accurate index of good ovulation, is actually achieving a pregnancy!

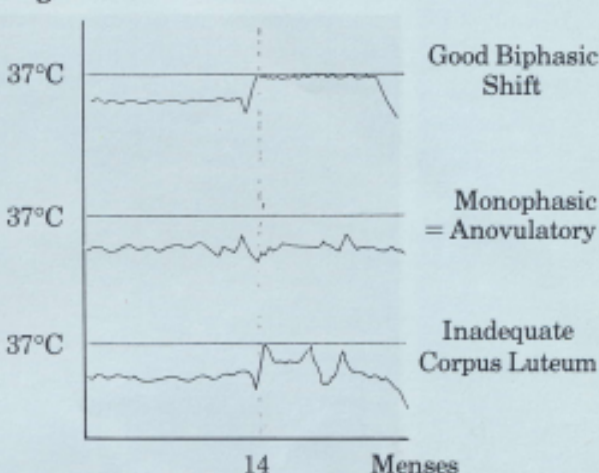
#### 2. The function of the cervix

This is assessed at mid-cycle when cervical mucus should be profuse and flow freely from the end of

## BBT: (Basal Body Temperature Chart)

The patient takes her temperature first thing every morning and charts it. Where there is a definite biphasic shift then ovulation is likely to have occurred. Unfortunately at least 20% of ovulatory women have a monophasic BBT<sup>4</sup>

Fig. 1



the cervical canal. The simplest method of testing, is to perform a post-coital test (PCT) at mid-cycle. The patient is assessed 2-8 hours after coitus. A small sample of endocervical mucus is taken and placed on a microscope slide and looked at immediately under the microscope. More than 5 progressively mobile sperm per high power field should be noted in an entirely normal post-coital test. At the same time a cervical mucous score (Insler) is performed (see Table 1). This assessment of cervical function gives an indicator as to the ability of the patient to produce mucous and to exclude dysmucorrhoea. An opaque mucus can be

## Post Coital Test

1. Should be performed prior to ovulation when cervical mucus production is optimal ie 12-24 hours prior to ovulation.
2. Time interval between coitus and examination should be from 2 to 8 hours.
3. Method: Using Cusco's bivalve speculum visualise the cervix.
4. Clean off the ectocervix with a swab.
5. Obtain cervical mucus from the endocervical canal by inserting a swab (pus swab) or disposable bacterial inoculating loop and turning it through 360° a few times and then withdrawing. Mucus can also be aspirated with a cannula and syringe.
6. The mucus is immediately placed on a glass

microscope, assessing the spinbarkeit (stretchability) of the mucus at the same time.

7. Thus mucus is assessed immediately under the microscope.

#### 8. Factors assessed:

- the amount of mucus pouring out of the cervical os
- the state/dilatation of the cervical os
- the spinbarkeit
- the amount of mobile sperm with good forward progression. There should be at least 5 or more/high power field for a positive test.

These findings are scored after Insler (see Table 1).<sup>5</sup> A score of 8/12 or greater is defined as "adequate" mucus.

**Table 1: Parameters of the cervical score and description of their grading (Insler)**

PARAMETER	SCORE			
	0	1	2	3
<b>Mucus amount</b>	<i>None</i>	<i>Scant</i> A small amount of mucus can be drawn from the cervical canal	<i>Dribble</i> A glistening drop of mucus can be seen in the ext. os - mucus easily drawn from the cervical canal	<i>Cascade</i> Abundant mucus pouring out of the ext. os
<b>Spinbarkeit</b>	<i>None</i>	<i>Slight</i> Mucus can be drawn app. 1/4 way down vagina from os	<i>Moderate</i> Uninterrupted thread of mucus can be drawn 1/2 way down vagina	<i>Pronounced</i> Uninterrupted thread of mucus can be drawn to vulva from ext. os
<b>Ferning</b>	<i>None</i> <i>Amorphous</i>	<i>Linear</i> Fine linear ferning seen - no side branching	<i>Partial</i> Good ferning with side branches in parts of the slide, linear ferning or amorphous mucus in other parts	<i>Complete</i> Full ferning of the whole preparation
<b>Cervix</b>	<i>Closed</i> Mucosa pale pink ext. os hardly admits thin applicator		<i>Partially open</i> Mucosa pink, cervical canal easily penetrable by an applicator	<i>Gaping</i> Mucosa hyperaemic, the ext. os patulous

the indicator of cervical infection. A negative post-coital in the face of a normal semen sample, is an indicator of either inadequate ejaculation or a sperm/cervical mucus interaction problem, ie cervical antibody production.

If the PCT is consistently poor in the face of a normal semen analysis then a formal sperm penetration test can be arranged with a laboratory.<sup>3</sup>

### 3. Fallopian tubes

Current methods for evaluating the tubes are via hysterosalpingography or laparoscopic assessment with dye-insufflation. The former methods of gas-insufflation (Rubens test) unfortunately carry too many false positive and negative results to consider them reliable in modern day fertility investigations.

### 4. Endometrium

Assessment of the endometrial cavity can be performed, either via hysterosalpingography or more recently the technique of hysteroscopy, particularly the new microhysteroscope, enable the doctor to obtain a good view of the endometrial cavity and for appropriate biopsies to be performed.

### 5. The peritoneum

Assessment is performed via laparoscopy, not only of the tubes and ovaries, but other areas as well.

Special effort must be made to look for adhesions, endometriosis and anatomical variations.

### • Male

A semen sample should be assessed in a reliable laboratory. A full ejaculate collected after 3-4 days of abstinence should be delivered to the laboratory as soon as possible after ejaculation (or preferably produced at the laboratory). The semen is assessed for volume, pH, total count, motility and morphology (normal ranges vary from laboratory to lab-

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*Today 90% of the causes of infertility can be identified*

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oratory). Should there be problems with the semen sample, other investigations may be appropriate, ie endocrine investigations and possibly testicular biopsy.

### General practitioner - specialist interaction

With the investigation of infertility, the roles which GPs and specialists play will vary from place to place. There can be no one answer to the question of when to refer and when to interact.

As outlined, a full history and examination of the couple can be done by the GP. Once the results are at hand and facilities are available in the referring area then close contact with specialist colleagues is appropriate.

Once the specialist continues investigations, general practitioner-specialist rapport is important, eg:

- counselling for surgery
- assisting at surgery
- helping in the post-op period
- ovulation induction can be carried out under specialist supervision, ie when to give drugs, what to monitor and when to trigger ovulation.

We suggest the following table as a guideline for a city practice with all facilities at hand.

		GP	Specialist
<b>Male</b> Semen	PCT	✓	
	Semen analysis	✓	
<b>Female</b> Ovulation	BBT	✓	
	Luteal progesterone	✓	
	Endometrial biopsy		✓
	Ultrasound	✓	
<b>Cervical factor</b>	PCT	✓	
<b>Tubal</b>	HSG	✓	
	Laparoscopy		✓
<b>Endometrial</b>	HSG	✓	
	Hysteroscopy		✓

PCT = Post Coital Test    BBT = Basal Body Temperature  
HSG = Hysterosalpingogram

**Table 3: Treatment**

		GP	Specialist
<b>Anovulation</b>	Clomid	✓	
	HMG		✓
<b>Uterine/Tubal factor</b>			✓
<b>Cervical factor</b>			✓

The order in which tests are done, should be determined by the circumstances and the findings on history taking and physical examination of the couple. In cases where the husband is reticent to attend, a Post Coital Test is a good non-threatening way to get matters started.

## *Not every applicant for infertility treatment wants to rear children*

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## From the Journals

### Introducing a drug formulary to general practice - effects on practice prescribing costs

P H G BEARDON, MSc, MPS  
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D A E MOWAT, MRCP  
J A GRANT, MB  
D G McDEVITT, DG, DSc, FRCP

*J Royal Col Gen Pract*, 1987, 37, 305-7

**Summary** A drug formulary comprising 249 preparations of 132 drugs and drug combinations was prepared by the partners in a three-doctor general practice serving more than 5 000 patients. No attempt was made to change to generic prescribing nor were

repeat prescription drugs altered. Introduction of the formulary in September 1981 was followed by an increase in the proportion of prescriptions containing drugs from the formulary from about 55% to more than 60% for both repeat and non-repeat prescriptions. The proportion of formulary drugs on non-repeat prescriptions reached a maximum of 78% within the first year with the additional influence of information feedback. Over the first year the level of formulary drugs used for both repeat and non-repeat prescribing levelled off at about 62%. Even with these modest changes when compared with the costs of general practice prescribing in Scotland as a whole, the introduction of the formulary resulted in savings of approximately 10% within the practice for the mean ingredient costs both per patient and per prescription.