

# Contraception update

**Part 1:** A practical review and evaluation of surgical methods and an introduction to oral contraceptives

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## Curriculum vitae

Dr K Esther Sapire studied at UCT where she obtained the MB ChB in 1952. She started work in Family Planning Clinics in 1957 in Rhodesia and after a course in Human Sexuality in Scandinavia and her appointment on the staff of the University of Rhodesia (Dept: Obstetrics and Gynaecology), began programmes and lectures on family planning and human sexuality with medical students, teaching staff, nurses and youth groups. She then moved back to Cape Town where she was appointed head of the Family Planning Unit at Groote Schuur Hospital and senior lecturer in the Dept of Obstetrics and Gynaecology at UCT, and where she is still teaching, taking care of patients and doing research in this field. Dr Sapire has published inter alia in "Obstetrics, Family Planning and Paediatrics" and was the author of the recent publication "Contraception and Sexuality in Health and Disease" (McGraw-Hill, 1986).

**KEYWORDS:** Contraception;  
Contraceptives, oral; Sterilisation,  
tubal occlusion; Vasectomy

## Summary

*This review deals not only with surgical approaches to salpingoligation and vasectomy, but also gives clear guidelines with regard to contra-indications for all contraceptives.*

The practice of contraception was revolutionised a quarter of a century ago with the advent of the "pill" and "loop" which provided effective, convenient, safe and reversible methods enabling couples to have almost complete control over the timing and number of children they chose to have. The array of modern contraceptive methods currently available are relatively free of major health risks. However, the most effective reversible methods have some troublesome side-effects, while the least effective methods have the fewest side-effects, and all have certain drawbacks.

Although considerable progress has occurred in contraceptive technology, perfect contraceptives are not yet available and may never be developed. Chemical analogues of luteinizing releasing factor appear promising but are still under clinical trial; research into vaccines has not proved to be successful; active immunity against Beta-HCG is still being investigated, and so far results of research into male contraception have been disappointing. It seems that the current available techniques or minor modifications of them will be used for many years to come.

It is therefore essential for doctors to have a working knowledge of the existing methods of contraception, of their mechanism of action, efficacy, their practical use and limitations, and to weigh up the benefits and risks of each method for individuals. It must be acknowledged that no method is absolutely effective (see Table 1). Patients must be helped to choose the most acceptable, effective, medically safe method by excluding contra-indications (Table 2), and considering the advantages and disadvantages (Table 3) and efficiency (Table 1) of available methods. The method most acceptable to the couple is the one most likely to be used effectively.

## Surgical contraception

There has been a dramatic upswing in the acceptance of voluntary sterilisation or permanent surgical contraception throughout the world. An important reason for this is the development of two relatively

**Table 1:** *Efficacy of contraceptive methods*

Method		Pregnancy/ 100 wy
Surgical	Vasectomy	0,02
	Tubal occlusion	0,13 (0,3-1)*
Injectable	Depo Provera 150 mg 12 weekly	0,2
	Nur-Isterate 200 mg 8 weekly	0,6
Oral	Combined monophasic	0,14-0,34 (0,7-7)
	biphasic triphasic Progestogen-only	0,0-2,1 (0-4,3)
Intra-uterine	Inert	2,7 - 3,0
	Copper 3 or 5 yearly	0,9 - 2,6
Mechanical	Diaphragm	2-3 (2-19,7)
	Condom	4,0 (3-36)
Spermicidal	Jelly, cream, foam, pessaries	0,3 - 40
Natural family Planning	Calendar rhythm	38,9
	Temperature	± 10,0
	Cervical mucus Symptothermal	22,9 (0,4-39,7) 11,2 (4,9-34,4)
Coitus Interruptus	Withdrawal	10 - 25
Post coital	Hormonal within 72 hours	0,16 - 1,6
	Cu IUCD within 120 hours	0,0

\* Use effectiveness is noted in parentheses if it differs from theoretical effectiveness

simple procedures - laparoscopy and mini-laparotomy, which allows tubal occlusion to be provided safely for women on an outpatient basis with local or general anaesthesia. Laparoscopy requires more highly specialised training and more sophisticated, expensive equipment than mini-laparotomy. Recovery is quicker after laparoscopy, but post-operative complications are fewer and less serious with mini-laparotomy.

Current research efforts focus on improving reversibility by using clips as opposed to cautery or the Pomeroy technique, which destroys a larger section of the tube. Microsurgery has greatly increased the possibility of reversing these procedures. Although all sterilisation procedures must be undertaken with the clear understanding that the operation is permanent, requests for reversal are increasing because more young individuals of low parity are accepting this procedure. Success of reversal after the use of Yoon rings and Hulka Clemens clips have been reported to be as high as 80%<sup>7</sup>.

**Non-surgical techniques** applying liquid silicone plugs or a sclerosing agent (Quinacrine HCL) through the hysteroscope may simplify sterilisation procedures, but at present the higher pregnancy rates limit their use. Non-surgical male methods are also being studied, including transcutaneous installation of compounds which will scar and block the vas deferens.

## *No one method is absolutely effective*

The decision to be sterilised must be mutual, informed and unpressured, and follow careful individual counselling. This should ensure that few patients subsequently regret the operation, and obviates the need for patients to fulfil arbitrary criteria related to age and parity. Ideally both partners should be interviewed to ensure that they understand the purpose, nature, consequences and risks of the procedure; that sterilisation is irreversible and the results of anastomosis are unpredictable. They must consider the use of reversible contraceptives so that they may keep their options open if they are unsure about a permanent procedure, and they must understand that absolute reliability cannot be guaranteed, although sterilisation is more effective than any other available method of contraception.

There is no basis for psychological effects of sterilisation per se. Regret tends to be associated with marital breakdown and divorce, and the desire to bear children with a new partner.

**Effects on menstrual bleeding patterns:** The literature is conflicting. Neil<sup>6</sup> reported an increase in menstrual loss and pain with menstruation in women who had been sterilised, especially after laparoscopic tubal diathermy. De Stefano<sup>2</sup> and Bhiwandwala<sup>1</sup> reported that the majority of women in large studies did not experience any change in cycle regularity, length, duration or amount of menstrual flow, dysmenorrhoea or intermenstrual bleeding (irrespective of the occlusive technique used) 2 years post-sterilisation. Those who reported change were as likely to have a beneficial as an adverse effect. Most of the menstrual pattern changes seen within 6 months could be attributed to prior use of oral or intra-uterine contraceptives. As most studies

### *So far results of research into male contraception are disappointing*

show that sterilisation does not cause menstrual disturbances, another cause should be sought if this occurs. Tubal occlusion does not affect *weight* or *sexual desire* or *responsivity*, and the operative risk is minimal.

**Vasectomy** is unquestionably the safest method of contraception available since there is little associated morbidity and no mortality risk. There is no interference with sexual desire or responsivity, and no adverse effect on health. Refinements of microsurgery and the availability of artificial insemination have enhanced the acceptance of vasectomy.

There is no significant alteration in circulating levels of testicular or gonadotrophic hormones, and spermatogenesis is virtually unaffected. Sperm antibodies may affect the fertilising capacity of sperm after reversal procedures, but there is no evidence that sperm

antibodies impair immunity to disease or cause any health problems<sup>5</sup>. Animal studies showed a higher incidence of atherosclerosis amongst vasectomised monkeys, but there is no evidence that men have an increased tendency to atherosclerosis following vasectomy. Goldacre<sup>3</sup> found no elevated risks of cardiovascular disease, acute myocardial infarction, hy-

pertension or diabetes among vasectomised men.

Following *reversal* of vasectomy, sperm recovery rates may be as high as 90%, but pregnancy rates are considerably lower, at 50%<sup>4</sup>. The main disadvantages of vasectomy is that it is not immediately effective, and contraceptives must be used until semen analysis demonstrates azoospermia.

## The new generation feminine pill



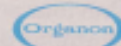
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**Table 2: Contra-indications**

**Absolute:** the method should never be used.

**Relative:** this may or may not become aggravated by the method, which can be used with careful observation and the method stopped if the condition is worsened.

Method	Contra-indications	
	Absolute	Relative
<b>Surgical</b>	Ambivalence about completed family or the procedure Marital instability Coercion Women over 47 years Gynaecological disorder	Under 30 yrs, low parity Grav 2 at 2nd Caesarean section Termination of pregnancy Nulliparity Sexual dysfunction (treat first)
<b>Injectable</b>	Impaired liver function Undiagnosed, irregular bleeding Hormone dependent tumour Porphyria Pregnancy	Thromboembolism Hypertension Migraine Diabetes (NI preferred to DP) Depression
<b>Oral</b>	CVS: coronary thrombosis CVA, hypertension, pulmonary embolus, thrombosis, phlebitis Prolonged immobility Hepatic: impaired function Gynaecological: abnormal bleeding, pregnancy Neoplastic: tumour of breast or genital tract, malignant melanoma, leukaemia Endocrine/metabolic: porphyria, hyperlipidaemia, pituitary disorder, hyperprolactinaemia Mental: psychosis, depression Age: over 35 years with risk factors for heart disease All women over 45 years	CVS: risk factors for arterial or venous thrombosis, valvular heart disease, mild hypertension, prominent varicose veins and obesity General: diabetes, renal disease Use of antibiotics, anticonvulsants, anti-coagulants Smokers, women over 35 Lactation  Migraine Epilepsy Chloasma Asthma
<b>Progestogen-only pill</b>	Impaired liver function Previous ectopic pregnancy Hormone dependent malignant tumour Undiagnosed abnormal bleeding Porphyria Pregnancy Enzyme inducing drugs	Previous or existing thromboembolism
<b>IUCD</b>	Menorrhagia, dysmenorrhoea Acute, recent, chronic infection Pregnancy, previous ectopic Fibroids, endometriosis Abnormal uterine bleeding Local malignant tumour Heart valve lesion Fixed retroverted uterus Uterus less than 5,5 cm	Nulliparous women Past history of P.I.D. Promiscuity Immuno-suppressive treatment  Anticoagulant treatment Diabetes Secondary amenorrhoea >6 months
<b>Mechanical</b>	Diaphragm: cystocoele, prolapse, shallow retropubic ledge, poor muscle tone Condom: unreliable man	

<b>Spermicidal</b>	Unreliable Allergic reaction Pregnancy contra-indicated	
<b>Natural family planning</b>	Poor compliance of both partners	Irregular cycles
<b>Coitus interruptus</b>	Pregnancy contra-indicated or undesirable Poor ejaculatory control Sexual dysfunction	
<b>Post-coital</b>	Hormonal: thrombosis, liver dysfunction, lactation IUCD: risk of active infection	

**Table 3:** *Advantages and disadvantages*

<b>Method</b>	<b>Advantages</b>	<b>Disadvantages</b>
<b>Surgical</b>	Effective, convenient, safe Male or female can choose Outpatient procedure for either One decision, one action, no further expense, supplies or motivation	Permanent Operative and anaesthetic risk Psychological sequelae Sterility not guaranteed, delayed until azoospermic (at least 3 mths) after vasectomy
<b>Injectable</b>	Most effective, reversible method in practice No patient failure Convenient, private Independent of coitus No oestrogen effects Lactation is enhanced Simple to administer	Disruption of menstrual cycles (erratic bleeding or amenorrhoea) Side effects (progestogenic) Delayed return of fertility (up to 2 years) Effect cannot be stopped at will
<b>Oral</b>	Effective Convenient Readily reversible Independent of coitus Beneficial medical effects Safe for nulliparase Overdose not harmful	Side effects Efficacy dependent on proper use Requires sustained motivation, proper instruction and use Increased incidence of cardiovascular disease, thrombosis Altered protein, lipid, CHO metabolism, coagulation factors Unsuitable for older women Lactation diminished
<b>Progestogen-only pill</b>	Minimal side effects Lactation unaffected No effect on BP or thromboembolism No morbidity or mortality or metabolic disturbances Effective, convenient, reversible No oestrogen side effects	Pregnancy risk Risk of ectopic pregnancy Irregular cycles Efficacy depends on compliance Requires sustained motivation

Method	Advantages	Disadvantages
<b>Intra-uterine</b>	Convenient, reversible, effective Provides long term protection Private, no patient involvement No effect on lactation Side effects local Suitable for older women	Risk of expulsion, perforation, pregnancy, (ectopic, abortion, prematurity) Increased incidence of pain, bleeding, infection Requires trained personnel Not suitable nulliparous women
<b>Mechanical</b>	No side effects or effects on metabolism or fertility Reduced incidence of sexually transmitted disease (condom), PID (cap), and Ca cervix (both) No medical supervision required (condom)	Efficacy depends on proper and consistent use Requires sustained motivation and forward planning and action around coitus
<b>Spermicidal</b>	No medical supervision required No systemic or metabolic effects	Not very effective Requires correct application with each act of coitus
<b>Natural family planning</b>	No physical or metabolic effects Always available	Requires cooperation, restraint and sustained motivation of both partners Failure rate higher than other methods
<b>Coitus interruptus</b>	No serious side effects No cost or medical supervision Always available, no equipment or preparation needed	High pregnancy rate Requires control of both partners No protection from STD Potential cause of sexual dysfunction
<b>Post-coital</b>	Extremely effective IUCD provides ongoing contraception	Emergency use only Side effects Hormonal: nausea, vomiting IUCD: as with routine use

Surgical contraception requires informed consent of both partners following careful selection and counselling. It prevents babies from being born, it does not prevent or cure sexual dysfunction or marital disharmony or menstrual disturbance, and should not be used for this purpose. In appropriate cases surgical contraception provides a most acceptable method for couples who have completed their families.

## Oral contraceptives (OCs)

There has been a progressive reduction in dose of both estrogen and progestogen since the original formulations became available in 1961. The doses now available are probably the lowest that are compatible with inhibition of ovulation. As it has become apparent that both estrogen and progestogen are implicated in the effects on cardiovascular disease and lipid and carbohydrate metabolism, prescribing habits have changed to low-dose pills. This has increased safety and acceptance and reduced the incidence of side-effects (nausea, breast tenderness, weight gain) as well as the more serious

effects on carbohydrates, lipid metabolism, blood coagulation and blood pressure. Therefore, the newer low-dose oral contraceptives are safer in terms of cardiovascular morbidity and mortality.

We are better able to identify women who are at risk (see Table 2). The weight of evidence shows that although there is a small risk of morbidity and even mortality associated with pill use, these risks are concentrated in women over 35 who smoke and have other predisposing factors to cardiovascular disease. It is important to recognise that smoking and the pill do not go well together.

**Women over 35** who smoke and/or are predisposed to cardiovascular disease should not use oral contraceptives.

**Women over 35** who are *non-smokers*, normotensive and slim, and have no risk factors for cardiovascular disease, can continue using low-dose oral contraceptives up to the age of 45 under close supervision, especially of *blood pressure*.

Women over 45 should not use combination oral contraceptives, as the risk of cardiovascular disease escalates, and other methods are preferred (tubal occlusion, vasectomy, minipill, IUCD or injectable contraception).

The risk of cardiovascular disease is not related to the duration of use and there appears to be no advantage in stopping pills at regular intervals "to rest". However, it is important to check patients at least 6-monthly for conditions that do mandate *stopping oral contraceptives*.

- absolute contra-indications arise, or
- relative contra-indications are exacerbated (see Table 2);
- severe side-effects;
- age as above;
- new onset of migraine, or pre-existing migraine becomes worse or focal;
- unusual, severe or prolonged headache particularly if associated with visual disturbance;

### *Sterilisation is more effective than any other method available, and vasectomy the safest*

- transient weakness, numbness or parasthesiae;
- loss of consciousness;
- slurring of speech;
- severe abdominal pain;
- hepatomegaly;

Alternative contraception e.g. Nur-isterate 200 mg should be offered 4-6 weeks prior to and 2 weeks post surgery.

It is good policy to change from pills containing more than 30-35 mcg ethinyl estradiol (EE) even though patients are "happy", and to *only* use the *lowest doses* of both estrogen and progestogen available unless there is a good reason to do otherwise:

1. **Anticonvulsant therapy:** drug interaction may reduce the efficacy of OCs and women should take pills containing at least 50 mcg EE so that in effect they are on a low-dose pill. This applies to all anticonvulsants except Epilim (sodium valproate).
2. **Persistent breakthrough bleeding:** the patient should be advised to use a 50 mcg EE OC for 6 months and thereafter revert to a triphasic pill.

As *breakthrough bleeding* occurs in up to 10% of women on low-dose pills in the first 3 months, good counselling is important prior to using oral contraceptives. Women should be encouraged to persevere, as it is a minor problem and not harmful to health

and does not indicate disease, and will improve in time. It is important to consider other causes of breakthrough bleeding after 3 months of use, and deal with them appropriately:

- Default
- Diarrhoea and/or vomiting
- Disturbance of pregnancy
- Disease
- Distress
- Drugs (anticonvulsants, antibiotics). Extra precautions (e.g. condoms) should be advised for the duration of treatment with an antibiotic, plus 14 days.

*Part 2 to follow in next issue*

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