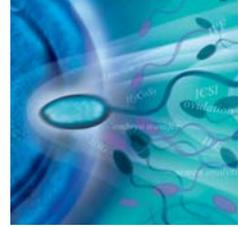




‘We’re having trouble conceiving...’



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BACKGROUND The growing trend for Australian women to delay childbearing has a significant impact on their individual fertility and the consequent need for assisted reproductive technology.

OBJECTIVE This article defines infertility and highlights typical male, female, and unexplained combined causes of infertility. Initial fertility investigations best undertaken in general practice are outlined, and suggestions on when to refer a couple to a fertility specialist is clarified.

DISCUSSION Initial assessment of the subfertile couple is best managed by the general practitioner whose relationship can facilitate quick understanding of how long the couple has been trying to conceive, age, and medical history. The woman can then undergo simple global blood and hormone tests while a semen analysis is appropriate for the man. On review, any abnormal tests can indicate referral to a fertility specialist for review and management.

What is infertility?

Infertility is defined by the World Health Organisation as the inability of a couple to achieve conception after a 12 month period of unprotected intercourse or the inability to carry pregnancies to live births.¹ Primary infertility applies to couples who have never conceived, whereas secondary infertility describes those who have conceived at some time in the past. One in six Australian couples of reproductive age experience difficulties conceiving a child.² The average age of women undergoing assisted reproductive treatment in 2002 was 35.2 years, and the average age of their partners is 37.6 years.³ Anecdotal reasons for delayed conception as reported by IVFAustralia's patients include:

- trying to conceive without success for 2–5 years without medical investigation – ‘we didn't realise we had a problem’
- voluntarily delaying childbearing in favour of establishing careers, relationship and financial security (often believing fertility treatments will be available as a ‘back up’ if needed), and
- the increased number of sexual partners and the potential of exposure to sexually transmitted infections contributing to infertility.

Conception in perspective

Fecundity is the chance of conception in a single menstrual cycle. The normal monthly success rate for couples trying to conceive naturally at age 25 years is 25%, this figure decreases with increasing female age particularly after 35 years.⁴ For example 74.6% of couples aged 25 years will conceive in less than 6 months, but by 35–39 years of age the chances of conception in less than 6 months drops to 25.5%.⁴

Causes of infertility

Causes of infertility are varied and involve both male and female factors. They include problems with the production of sperm or eggs, the structure or function of the male or female reproductive system, and/or hormonal and autoimmune (antibody) disorders in both men and women. After a woman's age, male infertility is the biggest single factor influencing a couple's chances of conception. Causes can be divided as follows:

- female infertility factors
 - hormonal disorders
 - damaged or blocked fallopian tubes
 - endometriosis
 - excessively thick cervical mucus
- male infertility factors
 - low sperm count (fewer than 20 million sperm per mL of semen is considered low)
 - poor sperm motility (movement) or morphology (shape), both of which may impede ability to penetrate and fertilise an egg
 - nonproduction of sperm due to obstruction and/or ejaculation failure.

General preconception care

General practitioners are uniquely placed to provide practical, personal advice to couples considering starting a family (see *Resource*). They should undertake the following:

- interview the couple together and understand their personal medical history and fertility experience to date
- undertake a physical examination of both partners to assess general health
 - discuss appropriate weight (ie. body mass index [BMI] as a guide) and healthy diet
 - encourage the cessation of smoking or any recreational drug use
 - discuss the benefits of regular moderate exercise compared to intensive fitness programs
 - assess current medications and their implications for pregnancy
 - recommend intercourse 2–3 times per week
 - blood tests for hepatitis B and C
- specifically for the woman
 - check for rubella immunity, and if required arrange vaccination before conception
 - perform a Pap test
 - discuss menstrual cycles and the woman's

understanding of ovulation and the 'ideal time' during a cycle to conceive (eg. basal body temperature chart, and consider urine luteinising hormone [LH] predictor kits available from pharmacies)

- explain the importance of tracking dates – first day of last period, and
- suggest folate 0.5 mg per day for 3 months before conception and the first trimester of a pregnancy.

When to investigate

It might be reasonable to wait 12 months before undertaking infertility investigation for couples under 35 years of age with no history suggestive of reproductive disorders. When a couple is over 35 years of age, it seems more helpful to only wait 6 months before undertaking investigations. If however, one or both members of a couple have a history suggestive of a fertility disorder, diagnostic testing of infertility should begin immediately.

History and examination

The first step in the evaluation of infertility is a thorough medical history and physical examination of both partners (*Table 1, 2*). To gain a quick understanding of the couple's specific situation, four questions should be asked:

- what age are the couple
- how long have they been trying to conceive
- have they ever been pregnant before, and
- do they have any idea why they are not pregnant?

Initial fertility investigations in general practice

If a couple's ability to conceive is in doubt, key initial investigations should include:

- confirmation of ovulation
- semen analysis, and
- checking for tubal patency and uterine abnormality (frequently undertaken after referral).

Confirm ovulation

There are numerous ways to confirm ovulation, but perhaps the simplest, cheapest and easiest way is a luteal phase progesterone test performed about 7 days before the expected period. A level approximately greater than 17 nmol/L is strongly suggestive of ovulation. Where the progesterone concentration is low, the following steps may be useful:

Table 1. Issues to consider in male infertility

Congenital abnormalities
 Prior paternity
 The frequency of intercourse
 Previous genital surgery
 Previous genital infections or trauma
 Medications and drugs
 Exposure to environmental toxins
 General health (diet, exercise, review of symptoms)

Table 2. Issues to consider in female infertility

Irregular or no menstrual cycle
 Painful, heavy periods
 History of genital infections or pelvic inflammatory disease
 Acne, hirsutism or galactorrhoea
 History pelvic surgery
 Abnormal pelvic examination

- check the length of the menstrual cycle in which the sample was taken
- ensure the sample was taken in the mid luteal phase, ie. 7 days before the expected period
- ensure that other endocrine tests are completed including day 3 follicle stimulating hormone (FSH) and LH, prolactin, free androgen index (FAI), and thyroid stimulating hormone (TSH)
- ultrasound scan is valuable to diagnose the presence of polycystic ovaries if anovulation is confirmed or LH or testosterone concentrations, or both, are elevated, and
- advice about weight gain or weight loss to achieve a BMI of 20–30 kg/m².

Alternative methods for determining ovulation include the use of:

- temperature charts (see *Patient education* page 139 this issue)
- LH prediction kits
- pelvic ultrasound, or

- endometrial biopsies.

These tests, with the exception of temperature charts, are not recommended as first line investigations because of either cost, or degree of invasiveness.

Semen analysis

A normal semen analysis will usually exclude a significant male factor. The man should abstain for 2–3 days before collecting a specimen, which should be analysed within 1 hour in an andrology laboratory. Normal values are given in *Table 3*. If any of the sperm parameters are abnormal, a second test should be performed 6 weeks later, as sperm usually take an average of 72 days to mature. More detailed sperm function tests are not required as a routine part of the initial investigations. The postcoital test is unreliable and is no longer recommended as a routine investigation.

Semen samples can vary enormously. If the semen volume is low, check the collection of the ejaculate was complete. If the first part of the ejaculate, which contains most of the sperm was missed, results will not be accurate. Lubricants such as soap or 'KY jelly' may inhibit sperm and should be avoided. If the male partner is having difficulty producing a sample by masturbation, then normal intercourse at home using a condom can be useful (avoid the use of condoms containing spermicide).

Investigations after referral

If not already performed, the tests outlined above to confirm ovulation for the woman and semen analysis for the man should be undertaken. Once the assessment has been undertaken, an individual treatment plan is formulated and recommended by a fertility team. This may range from natural options to 'high tech' assisted reproductive technology (ART) (see the article *The ART of assisted reproductive technology* by Jeffrey Persson page 119 this issue).

Table 3. Normal semen analysis

Volume	>2 mL
pH	7.2–7.8
Count	20 million/mL
Motility	>50%
Morphology	>30% normal
White blood cells	<1 million/mL

Confirmation of tubal patency

Assessment of a woman's tubal status and uterine cavity can be performed by:

- hysterosalpingogram (HSG)
- hysterosalpingo-contrast sonography (HyCoSy)
- laparoscopy and dye test with hysteroscopy.

Tests for tubal patency should ideally take place in the first 14 days of the menstrual cycle to avoid the possibility, however unlikely, of disrupting an early spontaneous pregnancy. Unless cervical screening for chlamydia has been performed, prophylactic antibiotics such as doxycycline and/or metronidazole should be considered to minimise the risk of infection developing after the procedure.

HSG and HyCoSy

Hysterosalpingogram and HyCoSy tests are outpatient investigations performed by inserting a catheter into the cervical canal after which contrast is injected. Hysterosalpingogram uses real time X-ray imaging to follow the flow of contrast into the uterus and tubes, whereas HyCoSy uses ultrasound. Both give excellent information pertaining to the shape and nature of the uterus. Hysterosalpingo-contrast sonography gives extra information because an ultrasound scan of the pelvis is performed at the same time allowing detection of fibroids and polycystic ovaries.

Laparoscopy and dye tests

Laparoscopy and dye studies require hospital admission and carry the hazards of general anaesthesia. However, at the time of laparoscopy further surgery such as diathermy to endometriosis, adhesiolysis or salpingostomy can be performed as part of the one procedure.

Assisted reproductive technology

Today, ART, which encapsulates a range of techniques, accounts for 3% of all babies born in Australia.³ Most couples experiencing fertility problems will require either 'normal in vitro fertilisation' or intracytoplasmic sperm injection.

The success rate per embryo transferred resulting in pregnancy and live births has improved dramatically due to critical improvements in the laboratory and clinical management of patients. Fertility specialists are focussed on reducing the number of multiple pregnancies previously linked to ART, and as such the associated health risks for both mother and baby.

Conclusion

The partnership between the general practitioner, obstetrician, gynaecologist, and fertility specialist is critical in ensuring patients receive appropriate, timely, and personalised fertility care.

Summary of important points

- Fertility declines with age.
- Undertake a physical examination of both partners to assess general health.
- Recommend intercourse 2–3 times per week.
- Consider early referral in couples with an abnormal history or in women aged over 35 years.
- A partnership between the GP, obstetrician, gynaecologist and fertility specialist is critical to fertility care.

Resource

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Conflict of interest: none declared.

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