Pre-conception care
in general practice

Integrating pre-conception care into general practice

Education to improve pre-conception health should be viewed as a routine part of primary care for all women of reproductive age. Many pregnancies are unplanned, so integration of pre-conception care into a general practice consultation can improve future pregnancy outcomes.

Some woman may consult specifically for pre-conception advice but in the majority of cases, the topic of pre-conception care is likely to arise opportunistically, e.g. at a consultation for a repeat prescription for contraception, a visit for a routine smear or a sexually transmitted infection (STI) check. Personal and cultural concepts of health, sexuality, fertility and pregnancy vary widely and therefore advice should be tailored specifically to the needs of the individual woman.

Ask about pregnancy risk or intent

Consider asking all women of reproductive age a single question about pregnancy risk or intent.[1] Encourage women to think about the right time and circumstances to consider pregnancy and prescribe effective contraception until this is desired. Provide education about modifiable risks during pregnancy such as smoking and alcohol intake and also provide education on how a pregnancy may be best achieved.

GPs and practice nurses should be aware of patients who, because of their obstetric or medical history, may have complications during pregnancy or delivery. The Ministry of Health Guidelines for referral in maternity care is a useful resource highlighting conditions which may require more complex management. This resource can be found at: **www.moh.govt.nz/moh.nsf/pagesmh/6257/$File/maternity-referral-guidelines-may07.pdf**

The pre-conception check

It is well established that the state of a woman's health has a direct effect on the health of the foetus. While population-level interventions exist, e.g. folic acid fortification of bread (although not yet implemented in New Zealand), targeted individual changes are needed to optimise the wellbeing of a woman and her child.

What is normal fertility?

Approximately 85% of couples should conceive after 12 months of unprotected intercourse during the fertile phase. Of the remaining couples, a further 50% will conceive over the next 36 months.[4]

Highest rates of pregnancy occur if couples have intercourse every one to two days during the fertile phase of the woman's menstrual cycle.[5] The fertile phase of the menstrual cycle begins approximately five to six days prior to ovulation and ends on the day of ovulation, although conception is more likely to occur if intercourse is timed within the three days prior to ovulation.[5] In a woman with a regular 28 day cycle, ovulation will usually occur on day 14 of the cycle (or 14 days before the expected date of the next menstrual period), so the best practical advice for couples is to have regular intercourse (every two to three days) starting at the end of menstruation, until about ten days before the woman's next menstrual period is due.

General guidance should be offered to all women of reproductive age because:

- It is estimated that 30–50% of pregnancies are unplanned[2]
- It is estimated that 51 per 1000 girls aged between 15 and 19 years become pregnant each year in New Zealand[3]
- Fertility begins to significantly decrease for women after age 35 years
- The risks during pregnancy for both mother and foetus rise after age 40 years

Women who have already had a child may need an update on pre-conception and pregnancy information that has changed, e.g. the use of iodine supplements in pregnancy.

Suggested format of a pre-conception consultation

A pre-conception discussion could include:

- An initial question about pregnancy risk or intent, i.e. do they wish to become pregnant, and when? Are they taking precautions to prevent the risk of becoming pregnant?
- A review of personal aspects of health that may have an impact on fertility and pregnancy, e.g. smoking cessation, alcohol and drug use, weight, diet, long-term conditions, medications, environmental exposures and psychosocial issues
- A review of current contraception

If the woman wishes to conceive, further actions could include:

- Discussion about the fertile phase of the menstrual cycle and optimal timing and frequency of intercourse (see sidebar "What is normal fertility")
- Prescription of folic acid – this is recommended at least four weeks before conception and for the first twelve weeks of pregnancy (see sidebar "Nutrition and supplements during early pregnancy")
- Checking of immunity status for rubella and varicella (chicken pox)

- Ensuring that cervical smears are up to date and considering if a STI check is required
- Checking that long-term medications are appropriate and safe
- Highlighting the issues regarding intake of caffeine, alcohol and other drugs and recommending avoidance
- Encouraging smoking cessation if applicable
- Discussing good nutrition, e.g. a well balanced diet which also optimises iron and calcium
- Giving general advice regarding personal health care and potential teratogens in early pregnancy such as avoiding x-rays and foods that may be contaminated with listeria (see sidebar "The risk of listeriosis during pregnancy")
- Giving advice about when and where to attend in early pregnancy

It is important to explain that conception may not be achieved immediately. In general, consider referral for evaluation of fertility for women aged under 35 years who have not conceived after 12 months and for women aged over 35 years who have not conceived after six months.[4]

Nutrition and supplements during early pregnancy

The importance of good maternal health during pregnancy is well accepted, however, it is equally important that nutritional status prior to pregnancy is optimised.

Folate reduces the risk of neural tube defects, therefore it is recommended that women planning a pregnancy should take a daily supplement of 800 mcg of folic acid.[6] Funded tablets are available in 800 mcg* or 5 mg strengths. Folic acid is also available for over-the-counter purchase at pharmacies. Higher doses (5 mg/day) are recommended for women with risk factors for neural tube defects, e.g. previous pregnancy affected by a neural tube defect, family history of neural tube defects, taking anticonvulsants, diabetes, obesity, coeliac disease (or other malabsorption syndrome), sickle cell anaemia. Folic acid is recommended for at least four weeks before conception and 12 weeks after.[6] Supplementation can be continued throughout the pregnancy.

* Contains gluten

Iodine is recommended throughout pregnancy due to changes in thyroid function, which may result in cognitive impairment to the foetus. Unlike folic acid, it is not necessary to take iodine pre-conception. The Ministry of Health recommends that pregnant women should take 150 mcg of potassium iodide per day.[6] NeuroKare Iodine, which contains 268 mcg potassium iodate (equivalent to 150 mcg potassium iodide) is available for prescription or over-the-counter purchase at pharmacies.

Iron requirements during pregnancy increase substantially after the first trimester, but it is important to have adequate pre-conception iron stores. This can be achieved through diet (e.g. lean beef and lamb) or if iron deficient, iron supplementation.

Many women choose to take a **multi-vitamin** supplement for pre-conception and early pregnancy needs (e.g. Elevit). Recommend that they choose a pre-natal/pregnancy specific supplement which contains adequate amounts of folic acid (recommended daily intake [RDI] 800 mcg), iron (RDI 27 mg) and potassium iodide (RDI 220 mcg) and avoid excessive vitamin A (RDI 800 mcg/2667 IU, do not exceed 10 000 IU per day).

For further information see: "Nutrition and supplements during pregnancy", BPJ 18, (Dec, 2008).

The risk of listeriosis during pregnancy

Listeria monocytogenes is a common bacterial pathogen found in soil, water, plants, sewage and animal excrement. In most people infection with listeria does not result in illness or harm, however, for elderly and very young people, people who are immunocompromised and pregnant women, infection with listeria can be much more serious. Listeriosis during pregnancy can result in miscarriage, stillbirth or premature birth and newborn infants with listeriosis can develop bacteremia and meningitis.

To prevent listeriosis, advise pregnant women to:

- Thoroughly cook foods until piping hot and eat straight away
- Thoroughly wash uncooked foods such as fruits and vegetables before eating
- Avoid raw or cold pre-cooked seafood products (canned products are safe)
- Avoid "deli" foods such as ham, pre-cooked chicken, other cold meats, meat spreads and pre-prepared salads
- Avoid unpasteurised milk and soft cheeses and other products made from unpasteurised milk

Discuss the benefits of healthy lifestyle activities

Smoking cessation

Smoking during pregnancy is associated with placental abruption, miscarriage, premature birth and low birth weight.[7] Harmful chemicals in cigarette smoke restrict the supply of oxygen to the foetus, retarding growth and neuro-development. Premature birth is the leading cause of neonatal mortality and morbidity, and low birth weight is associated with health problems in adulthood such as cardiovascular disease, type 2 diabetes and obesity.[8]

All pregnant women, or those who wish to become pregnant, who smoke should be strongly encouraged to stop. Smoking cessation interventions in early pregnancy are successful in reducing the number of women who continue to smoke throughout pregnancy, and therefore reducing the number of smoking associated complications of pregnancy and birth.[9] For all people, smoking cessation can be challenging, however, pregnancy is an incentive for many women to spontaneously quit. It has been demonstrated that smoking cessation interventions in pregnancy do not increase stress and psychological symptoms for the woman.[9]

Smoking cessation interventions for pregnant women may include advice and counselling about quitting, motivational interviewing, encouraging the use of rewards for cessation and nicotine replacement therapy (NRT).[9] The New Zealand Smoking Cessation Guidelines state that it is appropriate for pregnant women to use NRT.[10] NRT is associated with a small potential risk to the foetus, but in comparison, smoking poses a much greater risk. Intermittent NRT, i.e. gum or lozenges, is preferable to patches in pregnant women. If a patch is used, the 16 hour patch is most appropriate. There is insufficient safety evidence to recommend the use of bupropion or nortriptyline to women who are pregnant and varenicline is contraindicated during pregnancy.[10]

Weight

There is evidence that women who are overweight or

underweight have reduced fertility due to an increase in anovulatory cycles, and increased complications of pregnancy.[4]

Women with BMIs of greater than 35 kg/m^2 have been found to have a two-fold increase in the time required to conceive.[11] A BMI greater than 27 kg/m^2 is associated with an increased risk of complications during pregnancy such as gestational diabetes, pregnancy associated hypertension, longer labour and a decreased rate of normal vaginal delivery.[12] In addition, maternal obesity can lead to an increased risk of complications such as stillbirth, pre-term birth and macrosomia (infant with excessive birth weight). An infant that is large for gestational age is more likely to have shoulder dystocia at delivery and also to be predisposed to obesity later in life.[12]

A low BMI (less than 17 to 18 kg/m^2) is associated with an increased risk of infertility (a four-fold increase in time to conception[11]) and with an increased risk of pre-term birth and intrauterine growth restriction.

Weigh patients routinely and encourage them to achieve an optimal pre-pregnancy weight in the BMI range of 20 to 25 kg/m^2.

Physical activity

Moderate physical activity should be encouraged, particularly for women with higher BMIs. It is also important to discuss the potential negative health consequences of over-exercise. There is some evidence that more than seven hours of strenuous aerobic exercise per week is associated with increased rates of anovulation and therefore a longer time to conceive.[4]

Pre-conception care for men

Pre-conception care is not just for women. Men can benefit too. Sperm production takes 74 to 78 days, therefore interventions or lifestyle changes should ideally be started three months prior to planning conception and continued until pregnancy is achieved.

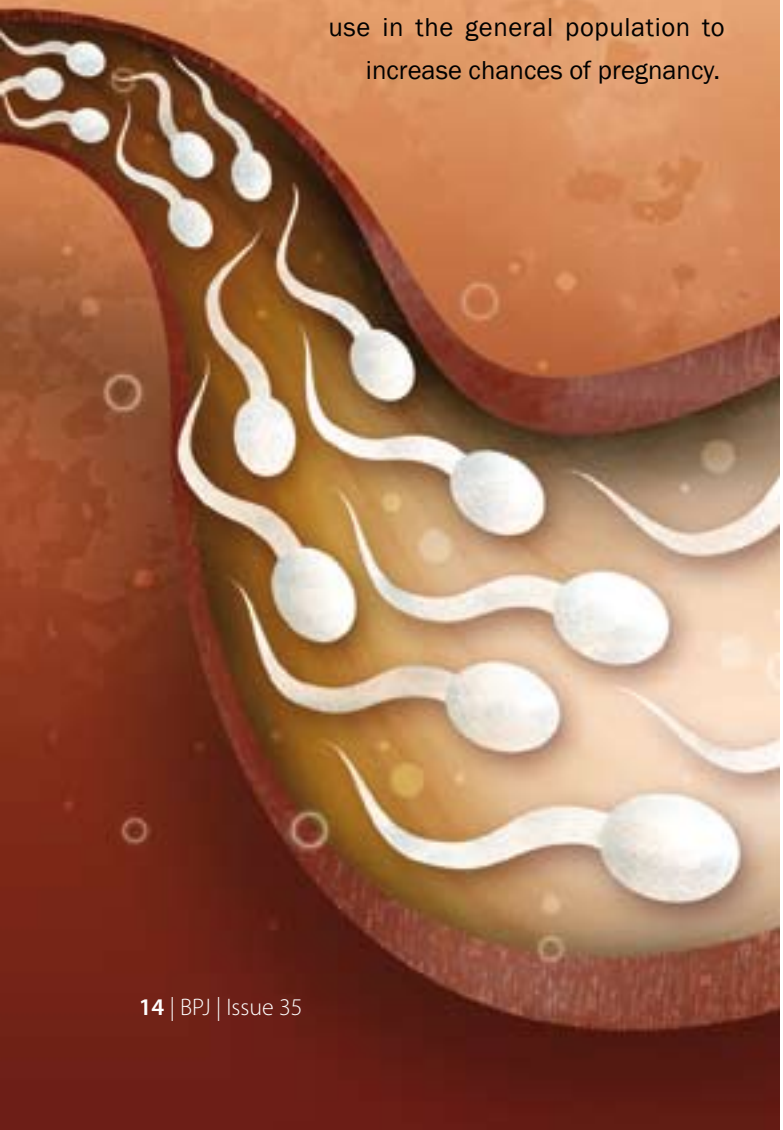
Pre-conception care for men could include advice about:[13]

- Maintaining a healthy weight – a BMI of greater than 29kg/m^2 may reduce sperm health
- Safe levels of alcohol intake – more than two standard drinks every day has been shown to reduce sperm quality
- Smoking cessation – smoking is known to reduce sperm count and motility and to increase the number of abnormal sperm
- Drug use – marijuana, cocaine and anabolic steroids have all been shown to reduce the number and quality of sperm
- Medications that may affect the quality and quantity of sperm, e.g. calcium channel blockers, corticosteroids, sulphasalazine, cimetidine
- Avoiding activities that increase the temperature of the testes, although there is limited evidence to support a direct effect on sperm quality, e.g. tight underwear, hot baths, laptops on knees[14]
- Optimising the number of ejaculations – optimal sperm quality (in number, morphology and motility) is highest when there is two to three days between ejaculations. Lower rates of pregnancy are found if the time interval between ejaculations is greater than three days.[4]
- Considering reducing workplace and recreational exposure to chemicals that may impair the quality of sperm such as pesticides and organic solvents in products such as paint strippers, degreasers and glues

Evidence that antioxidant supplements for men improve sperm health

Supplements containing antioxidants such as zinc, vitamin E, vitamin C, folate and carotenoids, e.g. Menevit, may promote sperm health by reducing oxidative stress. A recent Cochrane review of 34 trials (2876 couples) found that the use of an oral antioxidant supplement, by the male partner of couples undergoing fertility treatments, was associated with a statistically significant increase in the pregnancy rate and the live birth rate.[15] It should be noted, however, that the majority of the men in the trials were sub-fertile (i.e. low sperm count, decreased motility or abnormal morphology) and it is not known whether the same benefits would apply to men with normal fertility.

Antioxidant supplements could therefore be considered for sub-fertile men, but at this stage there is not enough evidence to advocate their use in the general population to increase chances of pregnancy.



References

1. Curtis MG. Pre-conception care: a clinical case of "think globally, act locally". Am J Obstet Gynecol 2008;199:S257-8.
2. Sackey JA. Pre-conception evaluation and counselling. UpToDate 2010. Available from: www.uptodate.com (Accessed Feb, 2011).
3. Ministry of Youth Development. Teenage pregnancy. Available from: www.myd.govt.nz/policy-and-research/teenage-pregnancy.html (Accessed Feb, 2011).
4. Hornstein MD, Gibbons WE. Optimizing natural fertility in couples planning pregnancy. UpToDate 2010. Available from: www.uptodate.com (Accessed Feb, 2011).
5. Practice Committee of the American Society for Reproductive Medicine in collaboration with the Society for Reproductive Endocrinology and Infertility. Optimizing natural fertility. Fertil Steril 2008;90(Suppl 3):S1-6.
6. Ministry of Health. Supplement (tablet) to take when pregnant or breastfeeding. Ministry of Health, 2010. Available from: www.moh.govt.nz/moh.nsf/indexmh/pregnancy-supplement (Accessed Mar, 2011).
7. Hammoud A, Bujold E, Sorokin Y, et al. Smoking in pregnancy revisited: findings from a large population-based study. Am J Obs Gyn 2005;192:1856-63.
8. Gluckman P, Hanson M, Cooper C, Thornburg K. Effects of in-utero and early life conditions on adult health and disease. N Engl J Med 2008;359(1):61-73.
9. Lumley J, Chamberlain C, Dowswell T, et al. Interventions for promoting smoking cessation during pregnancy. Cochrane Database Sys Rev 2009;3:CD001055.
10. Ministry of Health. New Zealand smoking cessation guideline. Ministry of Health: Wellington; 2007. Available from: www.moh.govt.nz/moh.nsf/indexmh/nz-smoking-cessation-guidelines (Accessed Mar, 2011).
11. Hassan MAM, Killick SR. Negative lifestyle is associated with a significant reduction in fecundity. Fertil Steril 2004;81(2):384-92.
12. Smith S, Hulsey T, et al. Effects of obesity on pregnancy. J Obstet Gynecol Neonatal Nurs 2008;37(2):176-84.
13. Frey KA, Navarro SM, Kotelchuck M, Lu MC.The clinical content of pre-conception care: pre-conception care for men. Am J Obstet Gynecol 2008;199:S389-95.
14. Wang C, Swerdloff RS. Treatment of male infertility. UpToDate 2010. Available from: www.uptodate.com (Accessed Feb, 2011).
15. Showell MG, Brown J, Yazdani A, et al. Antioxidants for male subfertility. Cochrane Database Syst Rev 2011;1:CD007411.