

ADVICE FOR
PHYSIOTHERAPISTS AND
OTHER HEALTH
PROFESSIONALS

**FIT
and
Safe**

*to exercise in the
childbearing year*



ASSOCIATION OF CHARTERED PHYSIOTHERAPISTS IN WOMEN'S HEALTH

Fit and Safe

This leaflet was compiled by members of the Association of Chartered Physiotherapists in Women's Health.

For the purposes of this leaflet the childbearing year is defined as the 12 month period between conception and 12 weeks postpartum.

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Wellbeing of Women

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Introduction

Studies have shown that exercising during the childbearing year is not harmful to either mother or baby if the pregnancy is normal and the mother healthy (Arena and Maffulli 2002). In the absence of certain contraindicated conditions (see page 10), there are well-documented benefits to exercise.

This leaflet is aimed towards the physiotherapist, working in any speciality, or other health professionals, who may come into contact with a woman in her childbearing year. The woman may be a patient of the physiotherapist or may seek her advice incidentally, while in the community or hospital setting. Records of questions asked and advice given should be documented and retained.

The leaflet attempts to offer advice as a framework for safe exercise in the childbearing year. Exercise may be performed in a variety of settings, which could include a hospital gym, an exercise class in hospital or community, a health club, sports or leisure centre or at home. The leaflet is not intended to be comprehensive.

Every pregnant woman is an individual with differing levels of pre-pregnancy fitness and varying degrees of aspirations of fitness both during the pregnancy and after. She may be a complete non-exerciser or an elite athlete. In order to offer the most appropriate advice, the physiotherapist, health professional or instructor needs to be aware of the physiological and physical changes which the pregnant body undergoes.

Aims of exercise

In pregnancy the aim should be to maintain, or moderately improve, the level of fitness whilst in the postnatal stage it is to regain, then improve, the former level of fitness

If there are no specific obstetric or medical contraindications, fit women can safely **maintain** the same level of fitness during pregnancy, although exercise schedules may have to be reduced. The American College of Obstetricians and Gynecologists (ACOG 2002) states that **'in the absence of either medical or obstetric complications, 30 minutes or more of moderate exercise a day on most, if not all, days of the week is recommended for pregnant women'**.

It is suggested that pregnant women should not undertake new, vigorous exercise, which would make them too warm, tired or breathless. Instead, they should aim to exercise at a moderate level. **Moderate exercise is that intensity which can be maintained whilst able to carry on a conversation.** The Borg Scale of Perceived Exertion (Borg et al 1983) or the Talk Test can be used, preferably at level 3-5 (see table on page 6).

Normal physiological changes in pregnancy

Cardiovascular changes

Pregnancy induces alterations in maternal haemodynamics (Artal et al 2003). Blood

volume can increase by up to 50% in the first and second trimester. There is a corresponding physiological response resulting in an increased heart rate, stroke volume and cardiac output. A decrease in vascular resistance causes a fall in arterial blood pressure. This is compounded by the decrease in vascular resistance of mainly the skin and kidney, and also the increase in the uterine vasculature and utero-placental circulation (Artal et al 2003).

These changes need to be considered in terms of body posture both at rest and during exercise. From around 16 weeks' gestation, lying flat, in the supine position, can result in obstruction of venous return resulting in decreased cardiac output. This position should be avoided during exercise and at rest whenever possible. For the same reason motionless standing should be limited as far as possible. Lowered blood pressure in early pregnancy can lead to feelings of dizziness and even fainting.

The heightened heart rate in pregnancy means that monitoring heart rate is an inaccurate measure of exercise intensity. Instead, the Borg Scale or Talk Test should be used. The aim is to be working at level 3 – 5.

Respiratory changes

The increased blood volume causes a rise in both tidal volume and respiratory rate. The pregnant woman may feel as though she is short of breath at relatively low exertion (see table on page 6).

Borg Scale of Perceived Exertion		Talk Test Guidelines
0	Nothing at all	Can easily carry
1	Very easy	on a conversation
2	Easy	
3	Moderate	You should be
4	Somewhat hard	able to carry on
5	Hard	a conversation
6		Can't talk
7	Very Hard	continuously
8		Can't talk at all
9		Can't talk at all
10	Maximal	Can't talk at all

Physiological changes during exercise include:

- 1 plasma volume increases before the red cell volume, leading to decreased ability to provide oxygen in response to demand, due to the normal physiological changes in plasma and red cell volume during pregnancy
- 2 increased demand causes raised respiratory rates
- 3 cardiac output values increase during pregnancy for the same activity over the non-pregnant woman and there is a loss of cardiac reserve

Vigorous or strenuous activity will compromise the mother's health and raise the risk to the foetus.

Pregnancy causes an increase in insulin resistance. Mild to moderate exercise decreases blood glucose levels, thus reducing the risk of developing gestational diabetes (Hartmann et al 1999; Marquez-Sterling et al 2000; ACOG 2002). An increased caloric intake compensates for the calories, which are diverted in the form of glucose via the placenta.

Basal metabolic rate is also raised and the normal foetal core temperature is 0.6°C higher than the mother's. Heat is transferred to the mother. This, together with the vasodilatation normal in pregnancy, tends to make the mother feel warm.

Musculoskeletal changes

Pregnancy results in a natural but gradual weight gain, which causes altered centre of gravity (COG) and balance, lumbar lordosis, and altered spinal curves. The effect of hormonal influences from 6 weeks' gestation can result in joint laxity that is normal in most pregnant women but sometimes may lead to joint dysfunction and pain. The pelvic girdle and lower lumbar spine are particularly at risk during pregnancy and may predispose about 50% of pregnant women to report low back pain. One hormone, relaxin, is believed to cause an increased extensibility of all ligaments, noted especially in the pelvic girdle (Artal et al 2003). It is important to bear in mind that although pregnancy-related osteoporosis is not common, it may be present in some women who report persistent pain, which often affects the spine.

Maternal and foetal physiological changes in response to exercise

Under normal conditions the foetus is protected and therefore unaffected by changes in maternal metabolism during exercise. During maternal exercise the foetus responds by increasing its heart rate and BP to facilitate the transfer of oxygen and to decrease the CO₂ tension across the placenta, thus protecting itself from potential harm (Brown 2002; Artal et al 2003).

Most women will instinctively limit their exercise intensity and duration to a level which is safe for the foetus. Research studies have concluded that submaximal (moderate) exercise does not induce hyperthermia and therefore does not compromise the foetus (Avery 1999; Hefferman 2000; Riemann et al 2000).

Uterine blood flow is inversely related to exercise but no adverse effects to the foetus have been identified.

Musculoskeletal considerations

All joints are more vulnerable to potential injury during pregnancy due to the decreased protection by ligaments.

All pregnant women should be aware that this increased joint laxity plus the alteration in COG and body weight will alter body biomechanics. These factors may result in low back and/or pelvic girdle pain or other joint pain. Incorrect technique when lifting, poor or non-adaptive posture, incorrect positioning or poor technique when performing exercises will all tend to exacerbate the discomfort.

Psychological benefits

Documented benefits from moderate exercise relate to a number of symptoms, increasing the level of psychological well being and decreasing the frequency of somatic symptoms, anxiety and insomnia (Goodwin 2000). Exercise is thought to boost self-esteem, body image and confidence and, when exercising with others, peer support is invaluable (Horns et al 1996).

Potential benefits of exercise

Research suggests that mild to moderate exercise is considered to be beneficial to the healthy pregnant woman and is not harmful to the foetus (Horns et al 1996; Avery 1999; Goodwin 2000; Hefferman 2000; Riemann et al 2000). Moderate intensity can be defined as being able to talk easily whilst increasing the mother's heart rate to a maximum 140bpm. However, further research on the benefits of exercise in pregnancy is needed and the physiotherapist should remain up to date with current literature

Potential benefits of exercise include:

- maintenance of cardiovascular fitness, respiratory and musculo-skeletal status (Kramer 2000)
- maintenance of healthy weight range for mother
- improvement of body awareness, balance, co-ordination and posture
- improvement in circulation and lowered diastolic pressure

- an increase in both endurance and stamina
- increased feelings of social and emotional well being, when exercise is combined with social interaction
- a possible reduction in problems during labour and delivery. Labour may also be shorter and there may be fewer interventions (forceps, caesarean section) (Bungum 2000)
- evidence of neurological benefits to the baby and developing child (Friedman 1999)
- a reduction in minor ailments of pregnancy
- suggestion of a more rapid post-natal recovery as the woman is likely to be fitter
- better glucose utilization by increasing insulin sensitivity
- suggested improved placental growth
- increased foetal growth

Contraindications, precautions and warnings

Absolute contraindications to exercise in pregnancy

- serious cardiovascular, respiratory, renal or thyroid disease
- poorly controlled type 1 diabetes
- risk of, or current, premature labour
- cervical incompetence
- history or risk of IUGR and premature labour – reduce activity after 12 weeks

- hypertension/hypotension – should be discussed with the woman’s doctor
- placenta praevia after 26 weeks’ gestation – should be discussed with the woman’s doctor
- sudden swelling of ankles, hands or face
- acute infectious disease
- severe rhesus isoimmunisation

Precautions to exercise in pregnancy

The following conditions may require some caution and it is advisable to seek medical advice before commencing any exercise.

- asthma
- diabetes type 1 if insulin regimes are well controlled and exercise is moderate (Arena and Maffulli 2002), discuss with diabetic consultant, GP or nurse
- history of miscarriage
- pre-pregnancy hypertension
- placenta praevia
- vaginal bleeding
- reduced foetal movement
- anaemia
- breech presentation
- extreme obesity
- extreme underweight / very low BMI
- heavy smoking
- thyroid disease

Warnings

All women should stop exercising immediately and seek advice from a midwife or doctor if they experience:

- abdominal pain
- leakage of amniotic fluid
- pelvic girdle pain which may also cause difficulty in walking
- vaginal bleeding
- shortness of breath, dizziness, faintness, palpitations or tachycardia
- persistent severe headache
- calf pain
- absence of or reduced foetal movements

Professional issues

Physiotherapists should refer to Rule 1 of the Rules of Professional Conduct (2002) and Core Standards (2005). They should recognise that each woman is individual and that she should be provided with enough information to make an informed decision concerning exercise in pregnancy. Some onus is on the woman herself to assess her own physical and emotional response to exercise and to report accurately any problems perceived. Monitoring the emerging research studies and accompanying data is the responsibility of the physiotherapist

Categories of exerciser

Broadly speaking, the pregnant woman will fall into one of the following four categories.

The complete non-exerciser

This group tends to be averse to exercise at any time and would probably not react favourably to coercion. However, gentle encouragement may result in participation in

basic exercise, which is preferable to none at all.

The non-regular exerciser

This group may wish to take up additional and more regular exercise during pregnancy.

Advise as follows:

- avoid starting a new exercise programme until after 13 weeks' gestation
- do consider beginning with reduced weight bearing exercises such as aquanatal, static cycling or Gym ball
- do start with simple and basic levels of exercise. Gradually increase exercise tolerance and progress exercise under the supervision of a suitably qualified professional

The regular exerciser

Guidelines for exercise in pregnancy (ACOG 2002)

Regular exercisers should:

- discuss with consultant, GP, physiotherapist or midwife before continuing their exercise regime
- exercise at least three times per week for 30 minutes or more, to improve aerobic capacity but discontinue contact sports
- self-regulate both the level of intensity and duration of exercise as the pregnancy progresses. This will help to keep core temperature below 38°C
- always aim for low impact activity
- reduce musculo-skeletal stresses by wearing supportive footwear

- prevent dehydration by maintaining an adequate fluid intake and should avoid exercising during hot and humid weather or with pyrexia
- ensure that they warm up and cool down for at least 5 minutes
- not overstretch because of the hormonal effects on the ligaments
- consult the relevant professional for advice on specific exercises, for example, for the pelvic floor and abdominal muscles
- avoid certain movements like low squats, cross-over steps, rapid changes of direction and ballistic exercise
- avoid aortocaval compression by not exercising in the supine position (supine hypotension syndrome)
- not restrict their calorific intake but aim to eat to appetite
- aim to include a variety of exercise such as swimming, walking, low impact aerobics to avoid overtraining
- not exercise to the point of fatigue

The elite athlete

This group should follow the advice given to regular exercisers and remember that the safe levels of aerobic exercise depend largely on previous exercise habits and ability (Warren and Shantha 2000). The physiotherapist should be aware that, being used to training regimes, the athlete is likely to be able to tolerate more concentrated bouts of exercise, but the same warnings and contraindications apply.

Research into strenuous activity during pregnancy is scarce. The serious athlete is sometimes difficult to monitor and advise, although moderation of her regime will be necessary.

Women with disabilities

The needs of the disabled woman should be assessed individually and advice and information offered regarding appropriate exercise.

Antenatal exercise

If the woman is familiar with the sport and has noted the contraindications and precautions, it is safe to continue many leisure exercise activities such as walking briskly, running, low impact aerobics, hiking, rowing, swimming (including aquanatal), cycling, dancing, skating and cross country skiing (ACOG 2002; SMA 2002).

Also, gym-based activities using equipment and weights, therabands or Swiss ball may be continued. Running and tennis can continue.

Contact sports pose a potential threat to the safety of the mother and foetus and should be avoided – hockey, football, basketball.

Those pursuits with a high risk of falling should also be discontinued – horse riding, downhill skiing, and some racquet sports such as squash.

Special sports such as scuba diving and exertion at altitudes over 6000' are dangerous.

Pilates and Yoga, both of which have been modified for pregnancy, are popular forms of exercise but should only be undertaken with an instructor who holds a recognised and appropriate qualification.

Common types of exercise

The pregnant woman should listen to her body when exercising and stop if she feels uncomfortable, fatigued or is unwell.

Swimming – an excellent type of exercise if the pace is sufficient to cause aerobic changes. If pelvic girdle pain is a problem, avoid the kicking action of the legs during breast stroke and ensure that there is no increased lordosis when swimming.

Specialist **aquanatal** classes may be available in hospitals or leisure centres. Water activities are joint-protective and have diuretic and oedema relieving effects.

Brisk walking during which the Borg Scale/Talk Test is correctly observed is an easy method of exercising when pregnant.

Low impact aerobics – where the emphasis is on maintaining fitness levels.

Modified Pilates or Yoga – these cater for the non-aerobic elements of fitness: flexibility, control of breathing and relaxation, core stability exercises, pelvic floor, posture and body awareness. ‘Modified Pilates’ exercises are known to provide a number of positive benefits and are commonly used in women’s health physiotherapy.

Backcare classes - where good back care technique may be taught . This could include core stability exercises, perhaps using the Swiss ball, and can be adapted successfully for the pregnant woman.

Gym-based exercise – the pregnant woman may use a static bicycle, treadmill or cross-

trainer, to maintain aerobic activity. Technique is especially important when strength training. Women should use light weights with sub-maximal lifts, aiming to use both upper and lower body muscle groups and vary the exercises. Weights, sets and repetitions should be decreased further as pregnancy progresses (Avery 1999). Resistance should be varied according to ability.

Circuit training may be included as part of the training regime as long as the basic advice is adhered to. Rest periods between activities may need to be longer and intensity closely monitored.

New classes, which periodically become popular, should be observed and evaluated by the physiotherapist before recommendation.

Advise the pregnant woman to:

Eat for energy, although not immediately before exercising

Use a chair, wall or support pole to help balance

Avoid overheating

Drink plenty of water to avoid dehydrating

Breathe out with effort

Keep movement slow and controlled

Avoid overstretching

Cross-train using a variety of exercise, for example, walk, swim, bike, weights, etc

Avoid working to overload

Sit, stand or lie on the left side to stretch or relax after exercise

Pelvic floor muscle exercises

Urinary leakage is common in pregnancy especially if exercising. It is important that women know how to exercise their pelvic floor muscles correctly and effectively to prevent/lessen leakage and are encouraged to continue after the baby is born (see Fit for Birth and Fit for Pregnancy leaflets, details on page 23).

Women should be referred to a specialist women's health physiotherapist if leakage persists.

Postnatal exercise

There are many valid reasons for exercising postnatally (Tanji 2000; Petridou et al 2001). Becoming active again as soon as possible after delivery is associated with less likelihood of developing postnatal depression provided the exercise is stress-relieving rather than stress-provoking (Koltyn and Schultes 1997).

The return to exercise should be gradual. Ligaments still exhibit laxity for up to 5 months after the birth so care should be taken not to resume high impact activity too soon. Athletes often return to increasingly intensive activity more rapidly and may well discover that the break in maximal training due to pregnancy will not have a significant adverse impact on their postnatal training regime (Lock et al 2001).

Physiotherapists are well placed to encourage all women, together with their new babies, to continue exercising for life

Screening

If there are no contraindications the pregnant woman should be encouraged to engage in regular, moderate exercise for 30 minutes or more per day on most, if not all, days of the week (ACOG 2002).

If this is in a formal setting, such as a gym or in a class, the usual details should be taken and records kept. In addition to the usual screening questions, enquiries should be made into her obstetric history, with particular emphasis on previous and current problems. The woman should be asked whether she has seen her GP and if her BP is stable. The woman should report all changes in her physical condition at each meeting.

General advice

- 1 wear a well-supporting sports/maternity bra
- 2 wear loose, light, cool clothing
- 3 wear supportive training shoes
- 4 do not exercise when feeling tired or unwell
- 5 do not exercise when in pain and show caution if experiencing discomfort
- 6 try to 'listen to your body' and act on what it indicates
- 7 avoid overheating
- 8 stay well hydrated
- 9 eat to appetite but not directly before exercise
- 10 exercise within the limits of the Borg scale / Talk Test

- 11 warm up before the aerobic content of a workout
- 12 stretching out after the aerobic content of a workout may be advisable
- 13 have fun and enjoy exercising

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ACPWH Aquanatal Guidelines (Available from Book and Leaflet Secretary; see ACPWH Journal)

Further information

The Chartered Society of Physiotherapy (CSP) Rules of Professional Conduct and Core Standards - available from CSP.

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Leaflets

Useful ACPWH leaflets

- Pregnancy-related Pelvic Girdle Pain (for mothers-to-be and new mothers)
- The Mitchell Method of Simple Relaxation
- Fit for Birth
- Fit for Pregnancy
- Aquanatal Guidelines
- Pilates

For details of these and other reading, see website

www.acpwh.org.uk

