



Exercise, nutrition and massage during pregnancy

Pregnancy can be a bewildering time even if it is not your first. The body is changing and so are different aspects of your life, for example eating habits and emotions. Therefore the multidisciplinary team at Pure have put together this document to provide advice to women who are pregnant.

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The purpose of putting this information pack together is to provide you with some information about being pregnant and advice about the exercise that can be undertaken, treatments that are available and also the best diet to be following.

The Following sections are included:

- **Exercise in Pregnancy**
 - Normal changes in the body during pregnancy
 - Is it safe to exercise during Pregnancy
 - Benefits of exercise
 - Which type of exercise is best
 - How quickly can exercise be re-commenced following birth
- **Nutrition and Pregnancy**
 - Pre-conception Nutrition
 - Nutrition during Pregnancy
- **Massage and Pregnancy**
 - Benefits of massage during pregnancy
 - Contraindications to massage during pregnancy
- **Strength and Conditioning in Pregnancy**
 - Exercise selection
 - Intensity, frequency and Volume
 - Monitoring



Exercise in Pregnancy

The research surrounding pregnancy and exercise is continually changing. It was not too long ago that it was advised to rest during pregnancy. However during the last few decades women have become more physically active participating in recreational and competitive sports. When women become pregnant generally they are keen to continue with their activities.

There has been a lot of stigma in the past with regard to exercises and what is and is not allowed during pregnancy. Unless you have any complications during pregnancy it should be possible to remain active and continue your sport or exercise at some level during most of your pregnancy.

Prior to starting any exercise programme during pregnancy it is essential that your GP is aware that you are undertaking exercise and also that you seek the help of a qualified and experienced professional such as a physiotherapist.

Normal changes in your body during pregnancy:

- Cardiovascular (CV) system
- Weight gain
- Digestive system
- Bladder and pelvic floor
- Loosening of ligaments
- Posture

CV system:

The changes that occur in the CV system are increased heart rate, increased diameter of blood vessels and decreased blood pressure. Your heart rate is likely to increase by 20 beats per minute in the first trimester. This leads to more blood being pumped out of the heart. The hormones circulating in the body during pregnancy have an effect on the blood vessels making them larger in diameter which then leads to decreased blood pressure, especially when lying on your back (from the second trimester onwards this is not recommended). During pregnancy, shortness of breath also occurs due to the CV system changes.

Weight gain:

It is natural to gain weight during pregnancy. In early stages of pregnancy this may be due to fluid retention. It is thought that there is approximately 1kg weight gain every 2 weeks in the last 10 weeks of pregnancy. This increase in body size may result in some impact activities such as jogging to be uncomfortable. Changes in body size and dimensions also alter posture (described later) which can then affect balance and co-ordination thereby making activities requiring quick changes of direction difficult.



Digestive System:

The hormones that are circulating in the body when pregnant have an effect on the muscles of the digestive system which can result in poor digestion, reflux and constipation. Therefore it is advisable to try and eat little and often.

Bladder and Pelvic Floor:

Again the hormones that are circulating during pregnancy cause decreased activity of the muscles of the bladder and ureters which may result in the bladder not emptying fully and thus urine may remain in the bladder which increases the risk of UTI (urinary Tract Infection). Also, invariably the increase in abdominal pressure may cause an increase in the sudden need to pass urine.

The pelvic Floor muscles mainly consist of 4 main muscles which sit like a hammock under the pelvis. These are weakened during pregnancy and may be damaged during birth. Those at risk of pelvic floor dysfunction include: complex vaginal delivery, chronic constipation, more than 3 deliveries, high birth rate, advanced maternal age and chronic respiratory problems. However the pelvic floor muscles are very similar to skeletal muscles and therefore can be re-trained. It is essential to start training pelvic floor muscles from the start of pregnancy and continue as comfort allows following birth (to be honest all of us ladies should be training the pelvic floor regardless of being pregnant or not!). These exercises need to be completed properly and can be prescribed by a physiotherapist.

Loosening of ligaments:

During pregnancy, due to the effect of circulating hormones there is a general relaxation of ligaments which will cause loosening of joints in preparation for birth. In particular the joints that are most commonly affected are those around the pelvis and the lower back. This may therefore put you at an increased risk of injury and it is recommended that care should be taken with activities which stress these areas such as jumping, excessive stretching and quick changes in direction. Strengthening exercises aimed at stabilising the joints may be beneficial in reducing in the risk of injury, however it is important that these exercises are prescribed by a suitably qualified professional such as a physiotherapist as it is very common in pregnancy to get muscles becoming over-dominant and causing muscle imbalance.

Posture:

Postural changes in pregnancy are normal. As pregnancy progresses changes occur in weight distribution and body shape changes. The baby grows forwards thereby changing your centre of gravity and increasing the curvature of the spine. This can cause posture related pain and depending on your postural type can cause some muscles to become overactive whilst others



remain under active. There are general trends with regard to posture, however it is worthwhile having an assessment by a physiotherapist with particular attention paid to your muscle balance.

Is it safe to exercise during pregnancy?

There are no studies to date that show an association between exercise and adverse outcomes for the foetus. However there are some **theoretical** concerns for the foetus and mother if exercising during pregnancy, these are:

- Overheating
- Effect on birth weight
- Level of exertion
- General risks
- Risks to mother re injury

Overheating:

It is thought that in the first trimester the foetus is susceptible to sustained increase of mother's core temperature. However, studies have shown that an expectant mothers core temperature did not exceed 38 degree's (normal value 37 degrees) when exercising at self imposed levels (discussed later). There has also been no research to support the link between exercise in pregnancy, hyperthermia and foetal abnormalities. Therefore it is recommended that pregnant ladies should exercise in a temperature controlled environment and also maintain hydration.

Level of exertion:

Here this really depends on the individual and the level of exercise pre-conception. It is not advisable to markedly increase the intensity of exercise once pregnant. For competitive athletes it is advisable to exercise at moderate levels. For those who are sedentary it is not advised to start an exercise program until 13 weeks of pregnancy. For sedentary women it is advisable to seek clearance by your GP and then seek the help of a qualified and experienced exercise professional such as a physiotherapist who can start a gentle exercise program such as Pilates. As a guide, pregnant ladies should be able to maintain a steady conversation when exercising, this ensures that the level of exertion is within safe limits.

Effect on birth weight:

Many studies have shown that there is no significant difference between birth weight of babies and exercise vs. non exercising mothers.



General Risks:

There are general risks such as the increased risks of falls secondary to decreased balance and co-ordination and changes in centre of gravity. The circulating hormones can cause joints to become lax and therefore at further risk of injury (discussed earlier). Therefore it is advised that activities which demand balance and sudden changes of direction (skiing) should be avoided.

Also there is suggestion that pregnant women should not participate in contact sports such as netball, however, there is no current research to support this concern. It is advisable to discuss participation in contact sports with the GP and be sensible regarding participation.

Benefits of exercise

There are many benefits associated with exercise in pregnancy. These include:

- More positive pregnancy experience
- Improved self confidence and body image
- May help in the prevention of gestational diabetes
- Increased social support
- Maintenance of CV fitness
- Preparation for labour
- Improved breath awareness and control
- Improved circulation
- Maintenance of muscles strength and flexibility

How much exercise and what type

This is really dependent on the individual and the level of exercise undertaken prior to becoming pregnant. The recommendations vary between an elite athlete, a recreational athlete and those who are not used to exercise.

Generally women who previously exercise and have not experienced any complications during pregnancy should be able to continue exercising in a similar way once reviewed by the GP. It is really important that exercise is discussed with the GP and also with an exercise professional who is aware of the stage of Pregnancy and any medical issues. This ensures that exercise can be continued safely and can be modified where appropriate.

Pilates is a great way of maintaining muscle length and strength while pregnant. Pilates can be practised throughout pregnancy. Again it is vital to check the qualifications of the Pilates instructor and to ensure that they are experienced in treating pregnant clients. Pilates does not however provide a CV work out.



How quickly can exercise be started after birth?

This is a question that is commonly asked and this also depends on the individual and the amount of exercise which was undertaken during pregnancy. This also depends on the type of birth. Following an uncomplicated normal vaginal delivery gentle exercises such as pelvic floor training, abdominal exercises and walking can be commenced as pain allows. It is again important here to seek the help and advice of a suitably qualified exercise professional such as a physiotherapist prior to starting exercise again. Following a C- Section it is usually advisable to wait approximately six weeks before starting a program – here it is essential to speak with a professional to get the right advice with regard to exercise for the current stage.

Nutrition and Pregnancy

Pre-Conception Nutrition

Making small dietary and lifestyle changes can be extremely helpful in the quest to become a parent. It only takes approximately three months for these benefits take effect. This is because it takes about three months for the follicles on your ovaries to develop before one is mature enough to release an egg at ovulation.

The body uses the nutrients from the food that you eat to repair cells, and produce hormones, healthy eggs and sperm. The aim therefore is to include all the vital food groups such as sufficient intake of carbohydrates, protein, fibre, essential fats and plenty of water.

Carbohydrates

To aid fertility aim to eat plenty of complex carbohydrates in the form of vegetables, whole grains like rye and wheat and legumes such as peas and beans. Whole grains are packed with fertility-boosting nutrients. It is best to limit your intake of simple carbohydrates such as white sugar and refined products.

Protein

Protein is important in helping to maintain blood sugar balance and gives your body the even supply of amino acids it needs for building and repairing cells, manufacturing hormones and a healthy reproductive system. This includes not only lean meat, oily fish but eggs, pulses, beans, nuts and seeds.

Dairy products

Some studies say dairy products have a beneficial effect on fertility because of their calcium content, while other studies have found that women who drink milk tend to be less fertile when older. The reason appears to be lactose, a sugar found in milk that some people can't digest and



that could damage human eggs. Another issue is their production and possible hormonal effect on your body. We know dairy foods increase concentrations of oestrogen in the blood. Try therefore to stick to a moderate intake of dairy products and try some of the alternatives on offer such as goat's or sheep's products.

Fats

Essential fatty acids (EFAs) play a vital role in fertility and the development of a healthy baby. They are crucial for the developing brain, eyes and nervous system of a growing baby. If you don't eat enough EFAs, hormone production will also be compromised. Good sources include nuts, seeds, flaxseed (linseed) oil and oily fish.

Caffeine

It has been found that caffeine can have an adverse affect on female fertility. Drinking more than 300mg a day (two to three cups) may also be associated with miscarriage and increase the risk of stillbirth by about 80 per cent.

Blood sugar levels

The amount of sugar (glucose) that is circulating in your bloodstream can have a huge impact on fertility. Blood sugar levels start to climb every time you eat; as a response your body then produces insulin to move the sugar into your cells to be used for energy. Many problems that lie at the root of infertility can be traced back to overproduction of insulin, and a resulting condition called insulin resistance. A diet based on whole foods is advised for you health and fertility.

Healthy Weight

Being a healthy body weight is important before pregnancy. Being underweight can affect fertility, making it more difficult to conceive. It can also increase the chance of the baby having a low birth weight. Being very overweight can also affect fertility and increases the risk of complications such as high blood pressure, infections and diabetes during pregnancy.

Lifestyle changes:

Give up smoking

This damages the reproductive system in both men and women.

Alcohol

Alcohol can interfere with your fertility.

Stress

Too much stress can interfere with sex hormone production. Libido in both men and women can be lowered by higher than normal levels of stress hormones.



Supplementation

As much as possible the aim is to get all the nutrients you need from a balanced diet. Unfortunately, even if you do try to eat healthily, your food may not always contain all you need. To make sure that you get all you need taking supplements including the nutrients folic acid, selenium and zinc is advisable.

Pregnancy

During pregnancy a woman's nutritional needs increase. The diet must provide sufficient energy and nutrients:

- to meet both the mother's typical needs and provide ample for the growth of the breasts, uterus and placenta
- to meet the requirements of the developing foetus
- to enable the mother to lay down stores of nutrients to help the growth of the foetus, and for lactation

Despite to the phrase 'eating for two', most pregnant women do not need to double their food intake. It is only during the latter part of pregnancy that extra energy is required. An increase of 200 kcals a day in the last 3 months of pregnancy is suggested, although the needs of individual women will vary, depending on their levels of activity.

Two hundred calories is equivalent to:

- two slices of wholemeal toast and butter
- a jacket potato with an ounce of cheese
- one slice of cheese on toast.

A weight gain of 12.5 kg in women of normal pre-pregnant weight is associated with the lowest risk of complications during pregnancy and labour. However the average weight gains vary between 11-16 kg.

When you are expecting your body becomes more efficient and makes even better use of the energy you obtain from the food you eat.

The best advice is to eat when you are hungry and to make sensible choices about the type of foods that you are eating.

A developing baby needs regular sustenance, so it's important not to miss meals.



Iron: requirements are increased during pregnancy for the growth of the placenta and foetus. Therefore it is recommended that pregnant women consume plenty of foods containing iron such as red meat, fortified breakfast cereals, pulses, breads and green vegetables.

Foods to avoid during pregnancy:

- Pate, raw or undercooked meat, poultry, and eggs (cook these until they are hard). They are all possible sources of bacteria that can harm an unborn child.
- Liver and liver products (pate) should be avoided because they may contain large amounts of the retinol form of vitamin A. Large intakes of Vitamin A during early pregnancy have been linked to birth defects.
- Raw seafood, such as oysters or sushi that has not been frozen before making.
- Cheeses with a white, mouldy rind, such as Brie and Camembert, and blue-veined cheeses like Stilton. They could contain listeria, a bacteria that could be harmful to the unborn baby.
- If you or your partner have a history of allergies such as hayfever, asthma, or eczema, avoiding peanuts during pregnancy and breastfeeding may reduce your baby's chances of developing a potentially serious peanut allergy.
- Drinking large amounts of alcohol can cause physical defects, learning disabilities, and emotional problems in children, so it is frequently recommended that you give up alcohol altogether while you are pregnant. If you decide to drink it is advised that you do not drink more than one or two units of alcohol, no more than once or twice a week, and do not get drunk.
- It is advised that pregnant women limit the amount of caffeine they consume to no more than 300 mg a day (around 4 cups of coffee). High levels of caffeine can result in babies having a low birth weight, or even lead to pregnant mothers miscarrying.
- It is suggested that pregnant women don't eat shark, marlin or swordfish, as it may contain potentially unsafe levels of naturally occurring mercury. It is also advised that pregnant and breastfeeding women eat no more than four medium-size cans of tuna, or two fresh tuna steaks per week.



Massage and Pregnancy

It is important that before undertaking any massage therapy whilst pregnant that you make sure your therapist is suitably qualified, to ensure your wellbeing.

Benefits of massage during pregnancy

- help decrease lower backache and headaches
- reduce oedema and swelling by increasing circulation and removing metabolic waste products
- decrease anxiety
- relieve muscular tension
- reduce the onset of muscle cramps
- massage helps to support the physical changes on a pregnant body by improving muscular and hormonal imbalances
- decrease fatigue

Contraindications of massage during pregnancy

- massage in the first trimester should be approached with caution
- massage treatment into and around the inner ankles and deep into the stomach are to be avoided
- appropriate massage oils/wax should be discussed with your massage therapist

Common areas that are prone to tighten during pregnancy are the gluteals, lumbar spine and upper thoracic region. This can be attributed to the change of centre of gravity and weight gain. These both place additional stress on the spinal muscles and as well as the widening of the pelvis during the latter stages of pregnancy.

Post partum due to the position held during breastfeeding, painful trigger points may develop within the muscle fibres leading to neck and shoulder pain. Primarily, muscles such as the Upper



Trapezius, Scalenes, Levator Scapulae and Rhomboids will be under increased tension, and may become sore and achy. Muscle fatigue will occur leading to further imbalances.

Massage is effective at alleviating any muscle soreness. It is especially beneficial when combined with Pilates type exercises from a Pilates instructor, strength and conditioner or a physiotherapist to help strengthen and stabilize these muscles.

Massage with a qualified therapist is beneficial from the second trimester through to full term, to improve aches and pains brought on with the changes pregnancy brings to your body.

Whilst receiving a massage during pregnancy, your therapist will place you in a safe, comfortable and supportive position. This will ensure optimum comfort for mother and baby.

S&C During pregnancy

Exercise during pregnancy is beneficial in terms of increasing strength, stability and CV fitness. Leading sports gynecologists recommend that training in both elite and recreational athletes can continue as normal but that the intensity and frequency of the workouts should gradually decrease during pregnancy. Sedentary women can safely begin a moderate exercise program as late as the second trimester, but pregnancy is not the time to begin a strenuous fitness program.

Exercise Selection

The shift in center of gravity shifts as well as the tendency to adopt a posture with slouched shoulders and an arched lower back often results in lower back pain during pregnancy. Thus, developing a strong core and back are important. This is best achieved through pilates type exercises focusing on developing deep postural core, back and upper back musculature. Bodyweight exercises such as unweighted squats are a useful alternative as the pregnancy develops, as are aerobic exercises which take some weight off the joints, such as swimming or cycling.

It's recommended that after week 12, exercises which involve lying on the back, or pressing against the stomach should be avoided, and later in the pregnancy one should be cautious of exercises which involve excessive head movement, balancing or involve prolonged periods of standing such as Olympic or overhead lifts.

Intensity, frequency & Volume

Training in the first trimester can be mostly normal as long as you maintain good nutrition and hydration and monitor any feelings of nausea, dizziness or low blood sugar.



For an elite athlete in the early stages (first trimester) of pregnancy it is sensible to take an approach which uses shorter sets combined with a lower intensity, resulting in a similar overall volume. So, for example, for an athlete that normally performs 3 sets of 10 reps at 65-70% of her squat 1RM you might modify her program so that she is performing something like 6 sets of 5 reps. Less experienced athletes may reduce the volume to a greater extent.

All athletes regardless of level should look to decrease intensity and volume from the fourth or fifth month onwards.

In terms of frequency, 3-4 weekly sessions of *training* has been recommended as the ideal, though pregnant women should aim for some gentle activity and movement every day.

Monitoring

Given concerns about joint laxity, heart rate, oxygen consumption, and overheating and the increased need for rest and moderation, self-monitoring of training is essential during this period, using tools such as the rate of perceived exertion. This is a good time to keep a journal that records eating, training, workout reports, notes on how you feel, heart rate, recovery, etc