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Exercise and pregnancy: information for practice nurses

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## Title: Exercise and pregnancy – information for practice nurses

### Abstract:

It has long been recognised that regular physical activity and exercise enhance both physical and psychological wellbeing. The benefits of physical activity throughout the lifespan of an individual cannot be underestimated and it is no less important when a woman is planning to become pregnant or is pregnant. The World Health Organisation (WHO) (2010) note that physical inactivity is the fourth leading risk factors for global mortality and is attributed to 6% of deaths globally. This article explores the guidance for physical activity for the general population and how it then relates to the guidance available for women who are pregnant. This article considers some of the key benefits to a range of common physical activities that pregnant women may undertake. It also explores some of the information that practice nurses should be aware of and how physical activity may impact on several long-term health conditions such as asthma, diabetes and obesity.

### Key words:

Pregnancy/exercise/contraindications/asthma/diabetes/obesity

### Key points

- Physical activity at any stage of the lifespan should be encouraged but physical activity in pregnancy is important for a variety of maternal and fetal health benefits
- Practice nurses should be aware of the long-term health benefits of physical activity, be able to discuss these with patients and signpost them to useful resources
- Practice nurses should be aware of any contraindications to physical activity in pregnancy
- Practice nurses play a vital role in the monitoring and surveillance of some life-long health conditions that also affect pregnant women

Keeping physically fit and active is recognised globally as an effective way in which to prevent many chronic medical conditions (Warburton and Bredin, 2016). Indeed, this is recognised by the WHO (2018) who consider that physical activity reduces the risk of coronary heart disease, stroke, diabetes, hypertension, various cancers including colon and breast cancer as well as having an impact on an individual's mental health. It also increases bone density, builds muscle strength and increases flexibility (Chui, Tudini and Sheng-Che, 2018) In addition, the

Department of Health (DOH) (2011b) recognise that being regularly physically active helps to maintain a health weight, helps an individual to be able to perform everyday tasks without being impeded and improves self-esteem and mental health. Chui, Tudini and Sheng-Che (2018) recognise the importance of a holistic approach to physical activity involving both endurance exercise for cardiovascular health, strength and flexibility activities for healthy bone density and good musculoskeletal health and body awareness and mindfulness during exercise to aid stress reduction and injury prevention.

It is well reported that exercise impacts on lipoprotein metabolism and primarily affects the plasma levels of high-density lipoproteins (HDL) and serum triglyceride levels (TRG). HDL levels increase and TRG levels decrease. In addition, exercise decreases total cholesterol levels, improves glucose tolerance and insulin sensitivity and decreases the risk of ventricular arrhythmias by altering the sensitivity of the myocardium to catecholamines. Aerobic and resistance exercise has also been proven to reduce diastolic and systolic blood pressure. All of these contribute to a risk reduction for cardiovascular disease (Chui, Tudini and Sheng-Che, 2018).

### General recommendations for physical activity

The DOH (2011a) published the 'Start Active, Stay Active' strategy which mirrors the WHO (2010) global recommendations for physical activity. Current recommendations are that adults should engage in moderate intensity physical active for at least 150 minutes each week. The alternative to this is 75 minutes of vigorous intensity physical activity each week or a combination of both moderate intensity and vigorous intensity physical activity. Moderate intensity physical activity can be described as an activity that results in breathing faster whereas vigorous intensity activity results in a faster heartbeat and difficulty in maintaining a conversation. The recommendations from the DOH (2011a), WHO (2010) and UK Chief Medical Officers (2017a) also suggest bouts of aerobic exercise should be no less than 10 minutes in duration. Aerobic activity will use large muscle groups over an extended timeframe which will use stored adipose tissue as an energy source and increase cardiovascular endurance (Box 1). Muscle strengthening exercises are also recommended on at least 2 or more occasions during the week that involve the major muscle groups. This could be yoga or pilates, climbing stairs, lifting small weight or using a resistance band.

## Physical activity in pregnancy

More recently the UK Chief Medical Officers (2017a) published their recommendations for pregnant women which reflect the guidance generally given to adults for 150 minutes of moderate intensity physical activity with muscle strengthening exercises twice a week. It is suggested that advice should be given to pregnant women on how to modify physical activity for them to remain comfortable during their pregnancy. However, where women are not active prior to their pregnancy they should be encouraged to get active and increase the length of time and intensity of an activity gradually.

There are however, contraindications to exercise in pregnancy that healthcare practitioners need to be aware of (Box 2). There are also various types of physical activity that should be avoided during pregnancy due to increased risk of complications to a pregnancy (Box 3). The UK Chief Medical Officers (2017a) conclude that physical activity will help to control weight gain in pregnancy, reduce the risk of pregnancy related hypertension, reduce the risk of developing gestational diabetes, it will improve overall fitness, improve sleep and have an impact on improving mood. There is no increased risk of preterm birth, small or large of gestational age babies or other complications for a newborn associated with women who are regularly engaging with moderate intensity physical activity (UK Chief Medical Officers, 2017b). Healthcare practitioners are well placed to educate women on any of these issues however it is important to note that midwives are the experts in caring for pregnant women so it would be appropriate to refer them if there are any concerns.

## Types of physical activity and the effects on pregnancy

### Walking

Walking is the most common and accessible form of physical activity particularly during pregnancy (Connolly et al, 2019). Connolly et al (2019) carried out a literature review that identified that walking during pregnancy has multiple benefits. The review noted that walking was the ideal form of physical activity to target women who were sedentary or participated in very limited physical activity. Community based 'Walking for Health' initiatives run by midwives, health visitors and the ramblers in the United Kingdom aimed at pregnant women or women in the immediate postnatal period have been shown to benefit women. These initiatives have been shown to increase energy levels, reduce stress, maintain a healthy weight, improve motivation, self-esteem and emotional wellbeing and give women the opportunity to meet new friends (Walking for Health, nd). Connolly et al (2019) recognised that although walking is very accessible there are several factors that perhaps prevent pregnant women from walking. Physical factors include back or leg pain, nausea and fatigue

and concerns over body size. Women reported that they had a lack of time and had to consider childcare and work responsibilities as reasons not to walk. The weather could also play a factor in the decision-making process. Some women have a lack of confidence and self-esteem particularly surrounding body image and this prevents them from walking (Connolly et al, 2019).

However, walking is very accessible for women with long term health conditions such as asthma or diabetes. Walking will help to control blood glucose levels, help with weight control and fatigue. The evidence on the effects of maternal walking on the fetus suggests that there may be a link between maternal walking and a reduction in the incidence of macrosomia and low birth weight, decreased risk of shoulder dystocia, hypoglycaemia and pre-term birth (Mudd et al, 2013, Hagaard et al, 2007). However, Connolly et al (2019) found that the evidence was less strong for the effects of maternal walking on fetal health compared to that of maternal health.

### Running

Running has now become a global mass participation sport and has been adopted worldwide as a way in which to keep fit and health and is seen not just as a sport for the elite athlete (Gordon, 2019). Indeed, parkrun has recently partnered with the Royal College of General Practitioners (RCGP) to promote health and wellbeing for their staff and patients (RCGP, 2018). Parkrun is an international network of free weekly timed 5km runs. This partnership supports the shift in the United Kingdom health service for more social prescribing as opposed to the use of medical interventions (Gordon, 2019). Women who run benefit physiologically by experiencing stronger pelvic floor muscles, increase oxygen uptake, lower TRG levels and higher HDL levels. Hadfield (2014) recommends that women runners should adapt their training goals as their pregnancy progresses and run regularly as opposed to increasing distance and pace and consider using a treadmill where the terrain is constant and controlled to minimise the risk of falls.

During the postnatal period women need to have information about postpartum incontinence, which in the majority of cases can be resolved by simply pelvic floor exercises. Whilst there are no recommendations for the amount of time before a women can return to her pre-pregnancy running schedule, she should be advised to return gradually.

Some women may experience musculoskeletal pain and this can often be attributed to the action of the hormones relaxin and progesterone on the joint, ligaments and smooth muscle fibres. Abdominal and pelvic issues are sometimes reported by women in the postnatal period and this can sometime be due to diastasis recti where the longitudinal abdominal muscles

develop a gap during the pregnancy. A referral to an obstetric physiotherapist would be the most appropriate course of action.

The hormone relaxin can also cause the arches of the feet to flatten and widen so women runners need to ensure that their footwear is correctly fitting and providing adequate support to prevent injury and musculoskeletal pain.

### Aquatic exercise

Swimming and aquanatal classes give pregnant women the opportunity to improve their cardiovascular and musculoskeletal fitness whilst experiencing the effects of buoyance and gentle resistance (Baines and Murphy, 2010). During exercise in water buoyance enables a woman to move more freely than when on dry land where they experience the force of gravity. Where a woman is experiencing oedema or weight gain that may affect mobility on dry land or the effects of relaxin and progesterone on the musculoskeletal system, the effects of water are invaluable. Whilst women will not experience total weightlessness they will experience a feeling a freedom of movement and of their bodies feeling lighter. Water buoyance also takes the impact off the lower limbs and can also improve the muscles of the pelvic floor (Baines and Murphy, 2010). Working out in water is approximately three times as hard as working out on dry land due to the resistance properties of water. This enables increased aerobic capacity of the cardiovascular system as it is put under moderate stress during exercise and the musculoskeletal system experiences some overload which has the effect of increasing muscle fibres, muscle strength, endurance and efficiency (Baines and Murphy, 2010).

### Yoga

Yoga uses a combination of poses, breathing and meditation to bring together the mind and body in a low impact activity. Yoga has been shown to improve posture and strengthen muscle groups in the back, abdomen and pelvic floor. Breathing awareness techniques and asanas (body movements) have been shown to be effective in reducing pregnancy discomfort and also improve a woman's ability to become more relaxed which can have an impact on labour and birth (Jahdi et al, 2017). Satyapriya et al (2013) reported that yoga reduced anxiety, depression and improved the pregnancy experience. Westbury (2019) carried out a small survey which identified similar themes: breathing practices that could be used during labour and relaxation techniques. However, the most useful aspect was found to be the holistic aspect of yoga classes where women could socialise and meet new people that would become lifelong friendships and support networks (Westbury, 2019). Yoga should only be carried out in discussion with a yoga teacher qualified to teach pregnant women and the postures adapted to suit the changes in the body during pregnancy.

## Pilates

Oktaviani (2017) describes pilates as low impact form of physical activity that focusses on developing core stability (abdominal muscles, low back and hips), improving posture, flexibility, strength and muscle control. Rodríguez-Díaz et al (2017) explains that pilates enables an individual to strengthen the weakest muscles and improve the elasticity of hypertrophied muscles and therefore reducing the risk of damaging their back or joints. Uppal, Manley and Schofield (2016) also note that pilates also improves coordination and balance. Similarly to yoga, pilates exercises need to be adapted to accommodate the changes during pregnancy. In a small scale study, pilates was found to reduce pain in pregnancy particularly in the third trimester (Oktaviani, 2017). Indeed Uppal, Manley and Schofield (2016) concurred with some improvement being recorded in pain scores from their pilot study exploring women's views of a pilates programme. There are however, very few studies on the effects of pilates during pregnancy and with the increasing emphasis on low impact physical activity during pregnancy this is an area where research needs to move forward.

## Long-term health conditions and physical activity – information for practice nurses

Women with long term health conditions such as asthma, diabetes, obesity should be encouraged to remain physically activity before, during and after pregnancy to help manage and maintain good health. Practice nurses play a key role in the monitoring and surveillance of these long-term conditions.

### Asthma

Asthma affects 1 in 10 pregnancies worldwide, according to Grzeskowiak, Grieger and Clifton (2018). Asthma is thought to affect between 3-12% of pregnant women (Scullion, Brightling and Goldie, 2013). A recent study suggests that a half of all women experience an exacerbation of their symptoms during pregnancy (Grzeskowiak, Grieger & Clifton,2018). It is thought that some of the physiological changes seen during pregnancy such as changes to the cardiovascular, respiratory and immunological systems may influence asthma control. It is therefore important for ongoing and regular monitoring of women who have asthma. Women should be advised to continue with their routine asthma medication. There are no known harmful effects from most first-line treatments such as inhaled relievers and inhaled corticosteroids however it is always good advice to have a medication review during the preconception period to ensure that women have the optimal treatment plan to manage their own care. If asthma is well controlled during pregnancy there are little or no increase adverse risks of maternal or fetal complications such as pre-eclampsia, hypertension, pre-term birth,

increased perinatal mortality and fetal hypoxia (British Thoracic Society and Scottish Intercollegiate Guidelines Network, 2016). The national guidelines on the management of asthma note that there is no increased risk to the fetus of major congenital malformations from asthma medication (British Thoracic Society and Scottish Intercollegiate Guidelines Network, 2016). Women with moderate or severe asthma should be monitored regularly throughout pregnancy to ensure that their asthma control is well managed. Regular advice about avoiding smoking and allergens that may trigger an acute attack as is adherence to medication. In some cases, physical activity is noted to be a trigger. Most women will be aware of their triggers and symptoms and how to manage them effectively.

## Diabetes

The guidelines from the National Institute for Health and Care Excellence (NICE), (2015a) state that women with type 1 diabetes are at increased risk of miscarriage, congenital malformation, still birth and neonatal death, large for gestational age (LGA) babies, birth trauma as a result of a LGA baby, higher risk of induction of labour and caesarean section, risk of neonatal hypoglycaemia and a risk of the baby developing obesity and/or diabetes later in life. Therefore, it is vital that they are aware that good blood glucose control before conception and throughout pregnancy will reduce these risks, but it will not eradicate the risks completely. HbA1c levels should be below 48mmol/mol (6.5%) prior to pregnancy. Women with an HbA1c level of 86 mmol/mol (10%) should be advised not to get pregnant because of the associated risk factors (NICE, 2015a). Women with diabetes should also be advised to take 5mg folic acid supplementation at least 1 month before conception and continue throughout the first trimester (NICE, 2015a). Healthcare practitioners caring for women with diabetes need to ensure that they inform women about the importance of exercise before, during and after pregnancy. However, because of the physiological changes occurring in the body during pregnancy this may have an effect of blood glucose control. Indeed, it is recognised that there can be an impaired awareness of hypoglycaemia particularly in the first trimester. NICE (2015a) suggest testing their blood glucose levels from fasting, pre-meal, 1 hour post-meal and at bedtime. Pregnant women should be seen every 1-2 weeks in a joint diabetes and antenatal clinic for close blood sugar monitoring and wellbeing check. The importance of exercise for general health and blood glucose control cannot be underestimated for women with diabetes. NICE (2015b) note that exercise can reduced the increased risk of cardiovascular disease through regular exercise. Women need to be aware that blood glucose levels may fall depending on the intensity of the physical activity and therefore there may be an additional requirement to adjust insulin dosage and nutritional intake along with more frequent blood glucose monitoring.

## Obesity

Obese women (BMI of 30 or more) should be counselled and encouraged to lose 5-10% of their weight prior to pregnancy as this would have significant long-term health benefits. This can be done through a supported weight-loss programme of both diet and exercise (NICE, 2010). However, dieting during pregnancy is not recommended. As with women with diabetes, a 5mg folic acid supplement is recommended. Physical activity during pregnancy for this cohort of women is recommended with the aim of recreational fitness as a way of getting active and staying fit so swimming or walking would be a safe and beneficial activity to recommend. Women with obesity who have not been physically active recently should be advised to start with no more than 15 minutes of physical activity three times a week increasing slowly to the recommended levels of moderate intensity physical activity. Regular weighing is not supported in pregnancy however a booking weight and one during the third trimester enables the team caring for the woman to make plans to be made for the appropriate equipment and any other requirements for the birth. Denison et al (2019) note that healthy eating and appropriate exercise will help to reduce the risk of weight gain and gestational diabetes during pregnancy. In addition, the risk factors during pregnancy mirror those in women who have type 1 diabetes so obese women need to have this information to enable them to make informed choices.

## Conclusion

The evidence supports the idea that physical activity has long-term maternal health benefits (Department of Health, 2011a & Chui et al, 2018). The role that practice nurses play in the monitoring and surveillance of long-term health conditions is a key component of ensuring women stay fit and healthy during a period of great physiological change. It is important to be aware of how pregnancy can affect a long-term health condition and the role physical activity can play in this. Physical activity should generally be encouraged during pregnancy for the many benefits but should be approached with some caution where contraindications may exist. Practice nurses can work collaboratively with midwives in providing ongoing care and advice for women. This has been shown to improve care, reduce costs associated with health-related conditions and enhances the outcomes for mothers and babies.

## CPD reflective practice

- What practical advice can you give a pregnant woman who wants to start being more physically active?

- As a practice nurse what interdisciplinary networks can you consult with if you need more information and support when caring for a pregnant woman with a long-term health condition?
- Reflect on the knowledge you have on long-term health conditions and pregnancy.

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TABLES:

BOX 1 - Forms of aerobic activity

Brisk walking

Swimming

Running

Cycling

Skipping

Football

Water aerobics

Hiking

(National Health Service, 2018)

## BOX 2 - Contraindications to exercise in pregnancy

Sports with high risk of trauma – football, hockey, horseriding, skiing, racquet sports, gymnastics, martial arts

Short cervix or cervical cerclage

Fetal growth restriction

Multiple pregnancy

Pre-eclampsia

Previous history of  $\geq 2$  pre-term births or history of threatened pre-term birth in current pregnancy

Placenta praevia

Premature rupture of membranes

Vaginal bleeding after 24 weeks

Haemoglobinopathies

Heart disease

Cardiomyopathy

Marfan or Ehler-Danlos syndrome

(Adapted from Newton and May, 2017)

### BOX 3 - Activities to avoid during pregnancy

Evidence suggests that for pregnant women who are not already physically active they should avoid starting to jog, run, play racquet sports or intense strength training as they lack the capacity to cope with the intensity associated with these forms of exercise.

High impact sports such as skiing, horse riding, surfing, gymnastics, off road cycling, football, basketball, ice hockey. Where there is a risk of impact or falling these activities are not recommended.

Due to the risk of decompression sickness and gas embolism, scuba diving is to be avoided.

There is evidence to suggest that ski diving is linked with lowering the uterine blood supply and therefore could have a harmful impact on the growing fetus. There is also a very high risk of impact so it is advisable to avoid ski diving during pregnancy.

American College of Obstetricians and Gynecologists (2015), UK Chief Medical Officers (2017)

### Useful resources and further information

Parkun: [www.parkrun.org.uk](http://www.parkrun.org.uk)

Walking for health: <https://www.walkingforhealth.org.uk/>

This Girl Can: <http://thisgirlcan.co.uk>

NHS Choices – pregnancy and baby guide: <https://www.nhs.uk/conditions/pregnancy-and-baby/>

Exercise in pregnancy: <https://www.tommys.org/pregnancy-information/im-pregnant/exercise-and-activity-pregnancy>

Swimming in pregnancy: <https://www.tommys.org/pregnancy-information/im-pregnant/exercise-pregnancy/what-kind-exercises-can-i-do/swimming-pregnancy>